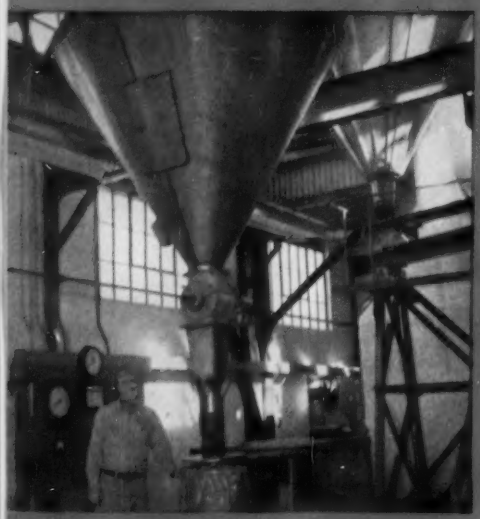
FEBRUARY 1956
35 CENTS

FOOD ENGINEERING

A McGRAW-HILL PUBLICATION



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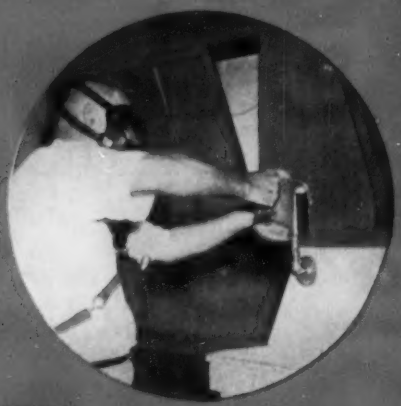

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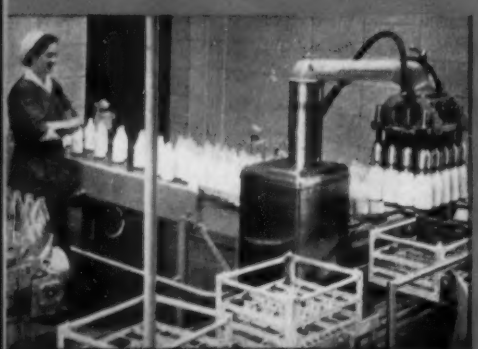

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INSTRUMENTS • TRANSPORTATION • QUALITY CONTROL
PRODUCTS • PERSONNEL

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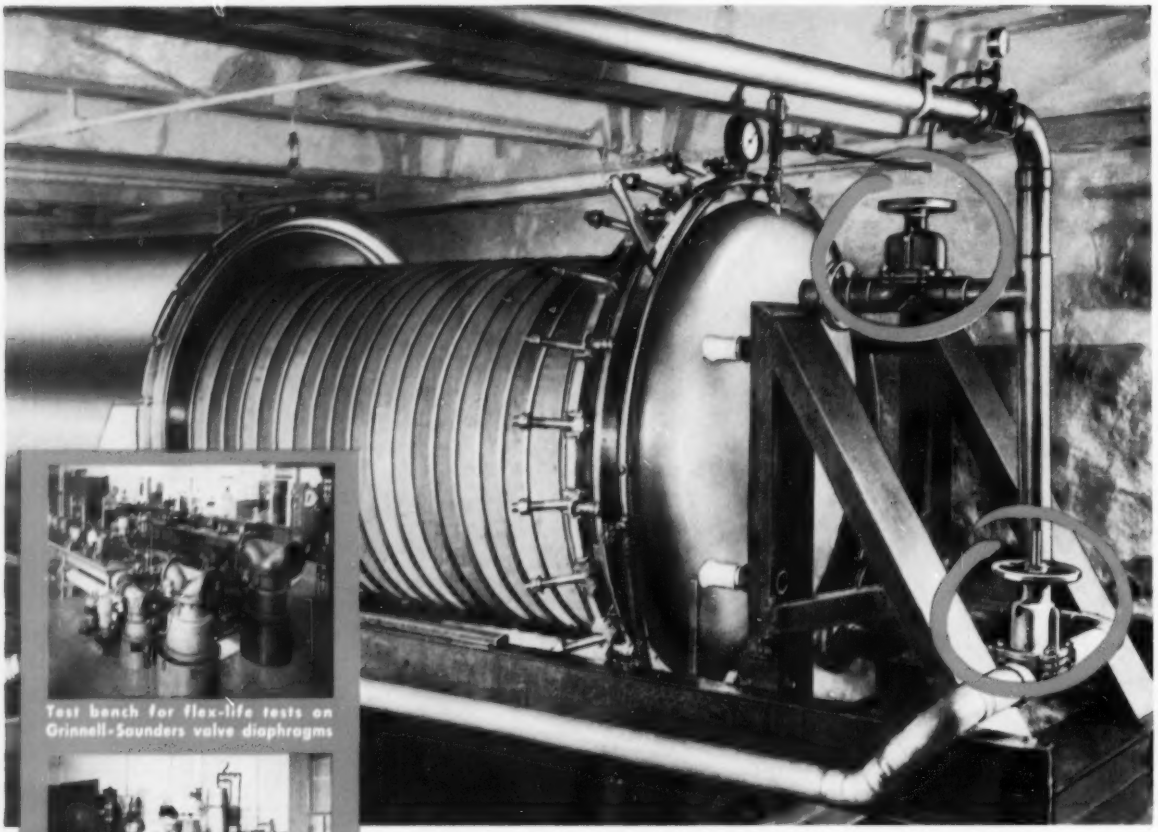
INQUIRY COUPON INSIDE BACK COVER

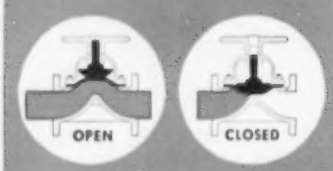


Grinnell-Saunders Diaphragm Valves on a Sparkler beer filter at Atlas Brewing Company, Chicago, Ill. Working closely with the brewing industry, Grinnell has improved the White Diaphragm and developed the Grinnell Full-Bore Diaphragm Valve, suitable for ball-brush cleaning.

Test bench for flex-life tests on Grinnell-Saunders valve diaphragms

Experimental mold presses for making diaphragms. Man in foreground is checking temperature of mold

Testing apparatus for checking durability of diaphragms under very hot or cold conditions



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February 1956

Volume 28 Number 2

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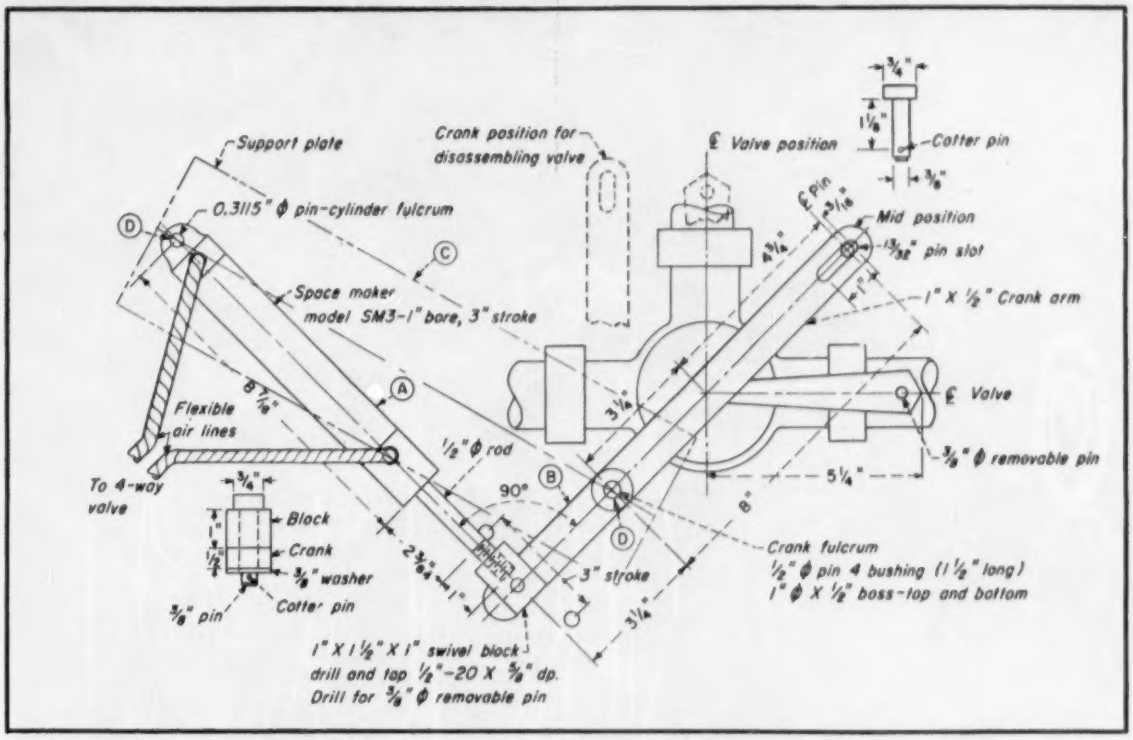

Remote Valve-Control

There are many situations where it is desirable to provide means for operating sanitary valves by remote control. This is particularly true for automatic operations and occasions where flow for a number of operations must be controlled from a central location, in keeping with the trend toward continuous automatic processing.

Here's a method of using a pneumatic valve-operator for a three-way sanitary valve. It is equally applicable for use with a two-way valve. A small air cylinder—(A) in sketch—is mounted at right angles to the crank arm (B) at its mid-position. A rigid support (C) is provided for fulcrum points of the air cylinder and the crank arm. This is best accomplished by providing a single steel plate about 4" wide by 14" long with the fulcrum pins (D) located and welded to the plate. This removes any possibility of strain or misalignment during stroking of the pneumatic operator.

The crank fulcrum point should be located on one side of the valve so that the crank arm can be swung out of place for disassembling the valve. This is easily accomplished by providing removable pins at each end of the crank arm.

Top surface of the valve handle should be flattened before drilling the pin hole. This will allow slight friction between the crank arm and valve handle and relieve strain on the pin.

In operation, air is applied to one end of the cylinder through a four-way air control valve. Air is automatically exhausted from the other end of the cylinder, thus allowing the piston to travel the full length of its stroke. Inasmuch as the piston is attached to the crank arm and in turn to the valve handle, the valve will move from the "on" position to the "off" position or from #1 position to #2 position for a three-way valve. Applying air to the opposite end of the air cylinder will retract the piston and return the valve handle to its original position.

All parts required for the assembly are easily made in any machine shop. Speed control valves should be installed in both air lines leading to the pneumatic cylinder. These valves should be set so there is a steady, even push on the piston. A sudden thrust may tend to rotate the whole valve body and transmit strain to the adjacent piping system. It may be helpful, in some cases, to provide a clamp support for the valve body or provide clamps for the adjacent piping close to the valve body.

Air cylinders and control valves are readily available from several manufacturers. If remote push button control is required, a four-way solenoid operated valve located close to the air cylinder will give good control.—*Leonard F. Patridge, Tuckahoe, N. Y.*

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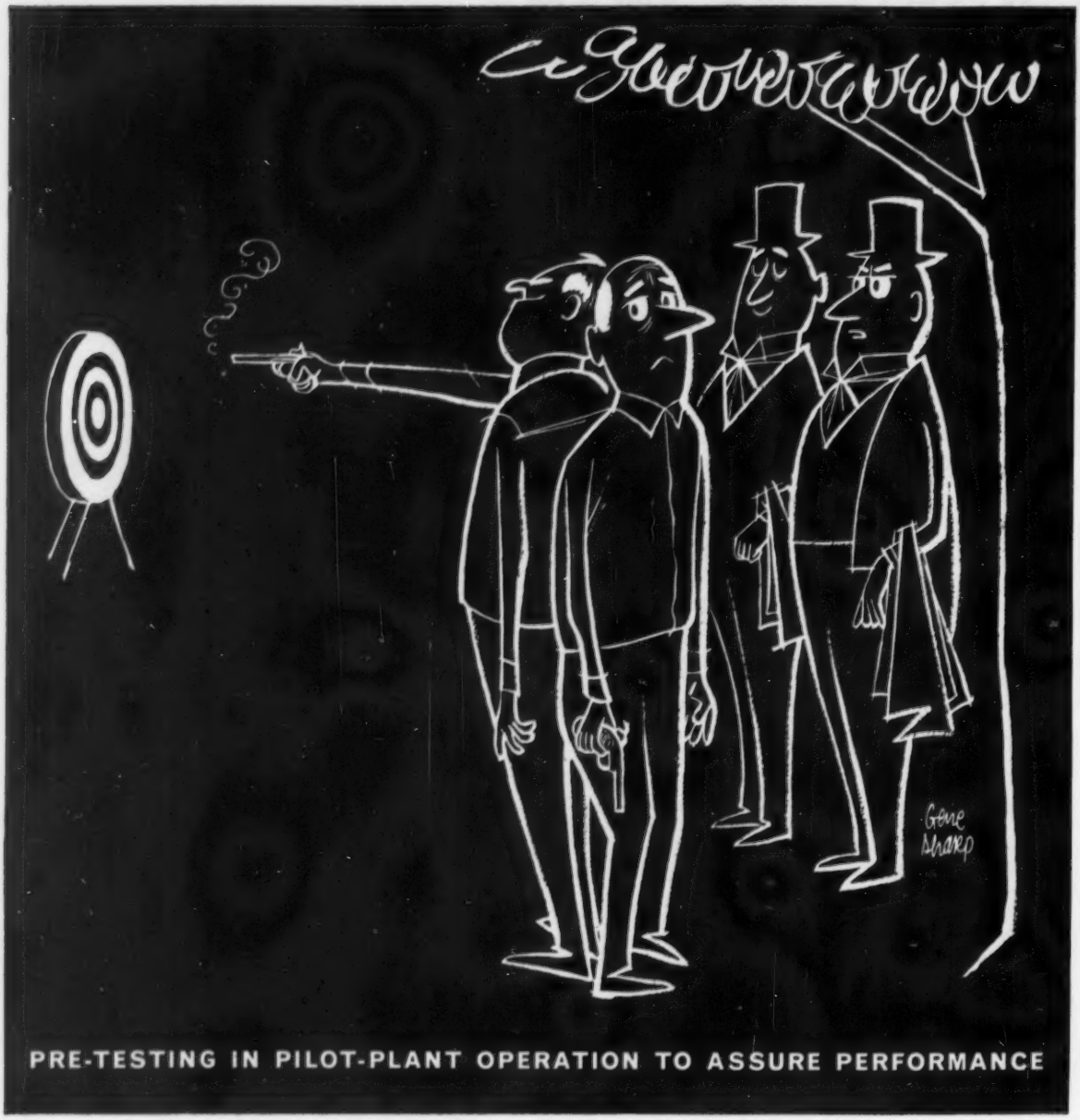

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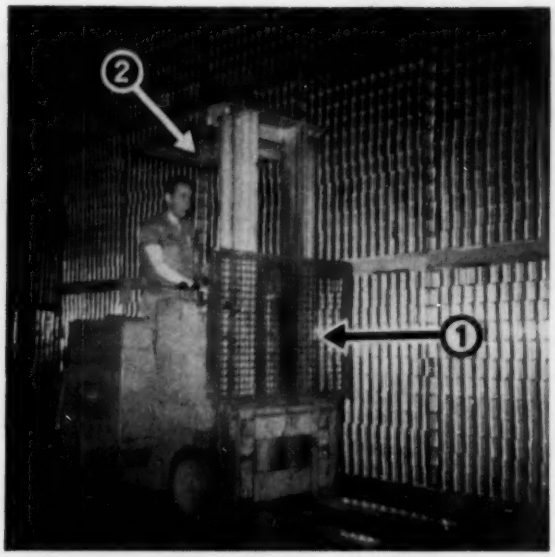
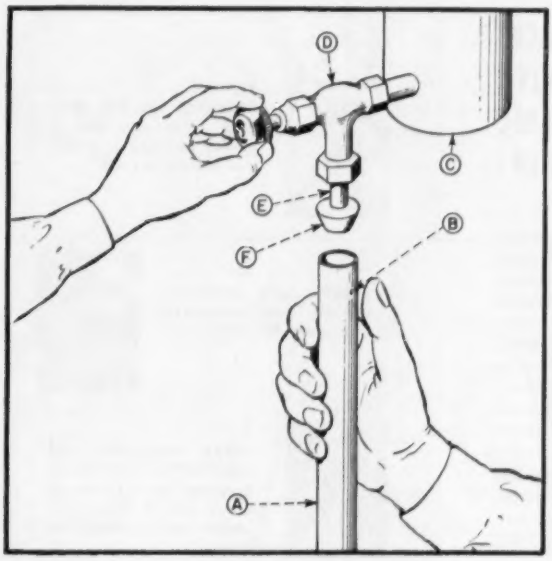


Two Truck Safety Devices

Since we now warehouse palletized bright-stacked cans, we prevent a shift in can alignment during trucking by a wire mesh on angle iron panel—(1) in photo—attached to the lift backing. A similar panel (2) over the driver, protects both operator and equipment from any falling object.—*O. J. Shackelton, Warehouse Supt. Washington Canners, Vancouver-Yakima, Wn.*



Vacuum Evaporator Sampler

Here's the equipment and method for drawing a sample for a solids test from an evaporator under vacuum, without overflowing the sampler.

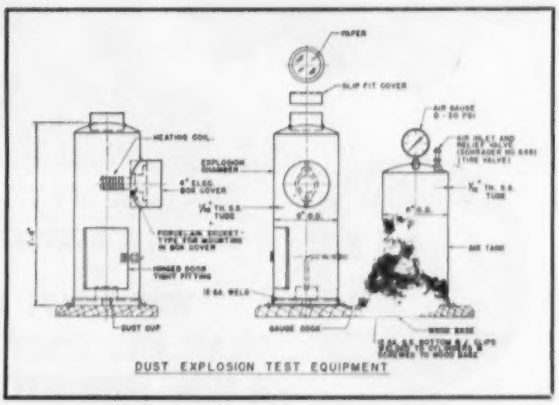
From a piece of 1½-in. stainless steel pipe–(A) in sketch—cut a 13-in. length and seal off one end. Then drill a hole $\frac{1}{16}$ in. dia. (B) 1 in. from the top of the pipe. The purpose of this hole is to permit air flow into the cylinder. This flow can then be stopped by placing finger over the hole.

From the bottom of the evaporator (C) attach a horizontal tube and to this tube a valve (D). Into the valve discharge screw a short nipple (E) with a cone-shaped rubber gasket (F) larger than the diameter of the sampler cylinder placed over one end.

Now, when a sample is to be drawn, the open end of the sampler is placed over the rubber gasket and held firmly in place with one hand while the other hand is used to operate the valve. If the $\frac{1}{16}$ in. hole in the sampler is closed off when the valve is open, the air is drawn from the sampling tube and replaced by the liquid in the evaporator.

When the sampler is judged to be full, the thumb or finger over the $\frac{1}{16}$ in. hole is removed admitting air to the portion of the cylinder above the control hole. Any liquid above this level is thereby sucked back into the evaporator. The valve may now be closed and the sample removed without having an over-filled sampler.

Experience may show that it is advisable to place a thumb over the hole in a sampler immediately after the valve has been closed just in case all liquid between hole and top has not been removed.—*William Elwood Bruce, Spencer Milk Products, Spencer, Wis.*



Big Boom For Safety

Post Cereals Battle Creek, Mich. has come up with a safety demonstration featuring an explosion. The object is to illustrate explosion and flash fire dangers present where fine dust is accumulated to show that good housekeeping is vital for safety.

The special gadget used came from an idea of Post's Plant Protection men. Engineering and Sheet Metal departments helped on the design and construction.

The device consists of an air tank at the rear and an explosion chamber in front. The chamber contains an electric coil which generates heat. When the air tank blows dust particles up toward the heated coil, you have your explosion. Result demonstrates without question the hazard of dust explosion.

Here's the operational procedure:

(1) Plug in 110 volt electrical outlet to heat the coil red hot. (An Eagle Glo-coil, or similar heater, is satisfactory.)

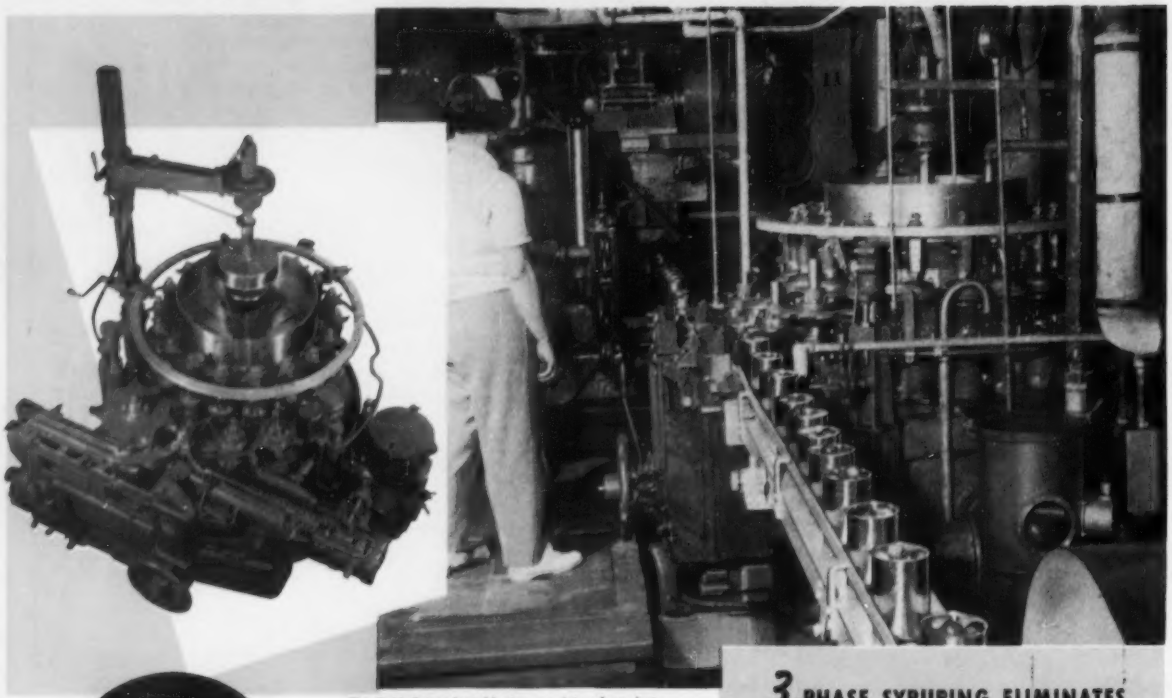
(2) Using tight-fitting door, place one-half teaspoon powder, cocoa powder, Instant Postum fines, or coal dust.

(3) Close door and place a piece of paper over the top opening, holding it in place with the slip fit cover.

(4) Operate the gauge cock to admit a small amount of 15 psig compressed air from the air tank.

To bring the lesson closer to home, at Post Cereals, the dust particles used were samplings taken from various operations in the Post plant.

The chamber has been used for demonstrations for all



The P·V·S is adaptable to a variety of products, including asparagus, cherries, apricots, boysenberries, clingstone and freestone peaches, fruit cocktail, fruit salad, pears, spinach, tomato juice, gravies, hot sauce and puree.

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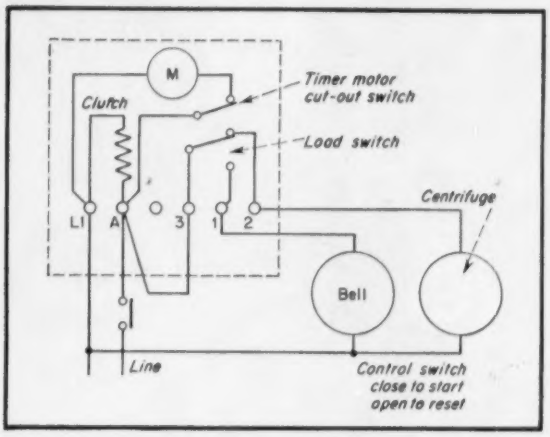
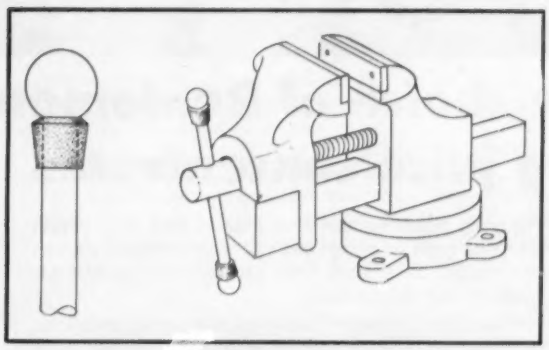
Post foremen and foreladies, and for several employee safety committee groups. Both Post and Carton & Container divisions are using it for fire training classes. In all, more than 500 employees will see the chamber in action and get the safety lesson.—*Technical Bulletin, General Foods Corp., White Plains, N. Y.*



Control for Testing Centrifuges

Often when running a Gerber butter fat test on milk in the plant laboratory, the operator would get involved in other operations and forget about the test.

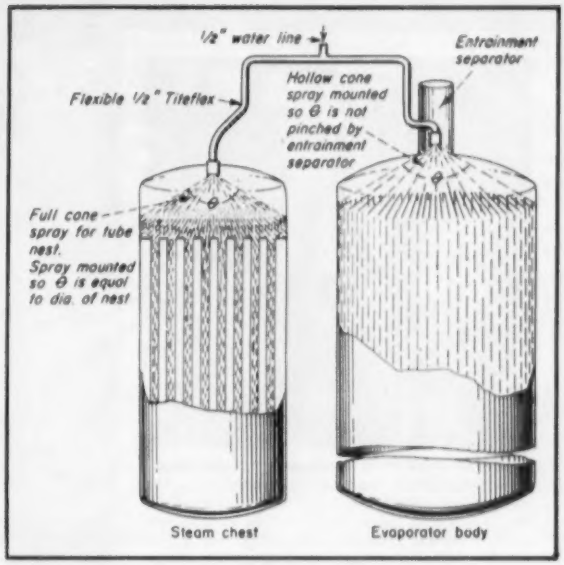
To correct this situation we installed a timer (see sketch) with automatic three-minute reset and with a double relay. When three minutes have elapsed the timer cuts off. The relay running the centrifuge drops out and a relay operating an alarm drops in and rings until the operator returns and throws the switch to the off position. Then the timer resets itself for the next operation.—*Gordon R. Rathbun, field man and quality control, Esmond Dairy Co., Sandusky, Ohio.*



Vise Handle Bumpers

To eliminate the possibilty of pinching fingers and hands between knobs on handles and screw of a machinist's vise, rubber bumpers may be installed on the handles.

The bumpers (see sketch) are bushings from Arctite electric plugs. With the purchase of Actite plugs, various sizes of bushings are included. From the excess bushings a choice of sizes may be made to fit all handle sizes of machinist's vises.—*National Safety Council, Chicago (DuPont Corporation contributed).*


½" water line
Entrainment separator
Flexible ½" Titeflex
Hollow cone spray mounted so θ is not pinched by entrainment separator
Full cone spray for tube nest. Spray mounted so θ is equal to dia. of nest
θ
Steam chest
Evaporator body

Spray Wash Speeds Cleaning

In the food industry the majority of down time on machines and equipment is due to the daily clean-up required, and cost of down time must be measured in lost production even more than in labor and overhead cost.

In our particular milk processing plant we have four double effect evaporators through which 90% of the 1 million lb. of milk per day we receive must be concentrated prior to drying. During the peak milk production months of May and June our volume rises to approximately 1.6 million lb. per day and this additional volume must be handled through the same equipment.

Formerly 3½-4½ hr. were spent each day per pan for cleanup after a 20-hr. run. This lengthy washdown period bogged down the receiving and separating departments, resulting in considerable time wasted in the departments waiting for the vacuum pans to come back on the line.

To cut clean-up time we provided for adequate inside rinsing by installing stainless steel sprays (see sketch) in the top of our evaporators. In the clean-up procedure we rinse three times, the first to remove products, the second to wash after caustic boil, and the third after the acid boil. Each rinse done manually by water hose requires 15-20 min. for flushing tube nests and evaporators. With the installation of the sprays this formerly time-consuming job is practically eliminated.

Four sprays were installed, one in the first effect nest, one in the first effect evaporator, one in the second effect nest, and also one in second-effect evaporator. By simply turning a valve the operator can rinse the pan in a few minutes. The time saved per pan per day is now 45 min. to 1 hr. and this time, formerly lost, is now production time which has helped to increase plant capacity by about 80,000 lb. per day.—*R. B. Drexler, Assist. Plant Supt., Rochester Dairy Co-op, Rochester, Minn.*

Ends Mix Pump Pipe Breaking

Frequently during plant washings our clean-up crew broke the solder joint of our mix pumps inlet pipe.

This problem was solved by replacing the unit's stainless steel feed pipe with a piece of plastic hose. Now when the Univats are slightly out of line the plastic hose prevents the strain from breaking the solder joint at the

In addition to the many permanently mounted Moyno pump installations, Realemon has two Moyno pumps mounted on wheels which can be moved to any of the 24 blending tanks. This provides a quick and economical way of blending the juices. The Moyno is self-priming; won't cavitate or vapor-lock. It has no valves to stick, no pistons to gum up. It's trouble-free and built for tough service.

The Moyno pump has had an outstanding performance record for more than 8 years at Realemon-Puritan Company, Chicago, Ill., makers of the famous Realemon beverages. Fruit juice concentrates must be pumped and filtered to blending tanks . . . a task only Moyno pumps can perform to Realemon's satisfaction.

Moyno® Pump exclusive choice of Realemon engineers for pumping juice concentrates

In the preparation of many of the famous Realemon products, concentrated fruit juices often must be pumped and filtered to blending tanks.

Pumps formerly used to handle this exacting process wore out completely in a few months because of their inability to stand up under the high acids in citrus juice concentrates.

Realemon then changed to the Moyno pump. Its unique rotor and stator arrangement forms sealed progressing cavities that move the material and provide positive displacement. For this Realemon application, Moynos with chrome-plated rotors and synthetic rubber stators were selected, to assure trouble-free service and long pump life.

Moyno pumps have now been in operation at Realemon for more than eight years, with an outstanding performance record. The only maintenance required is simply to replace the rotor and stator about once a year.

Moynos regularly handle a wide variety of products that other types of pumps can't handle—products such as potato salad, chow mein, fruit, alkalis, pastes, paints, tar —even cement and plaster.

Perhaps the Moyno will solve your pumping problems, too. Write us today for complete information. Ask for a free copy of Bulletin 30-FE.

ROBBINS & MYERS, INC.

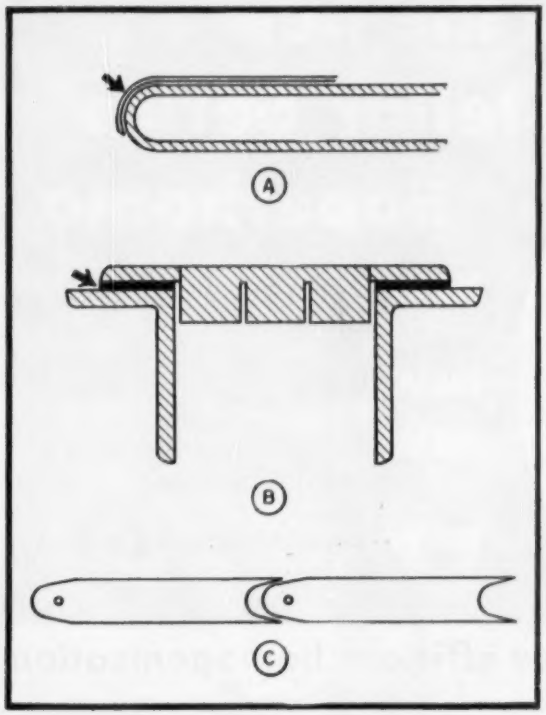
MOYNO PUMP DIVISION

Springfield, Ohio
Brantford, Ontario

pump. Hose selected was Tygon tubing carried by most dairy supply houses.

To provide fittings in each end of the hose we cut two lengths of 1½-in. pipe approximately 6 in. long, filing the raw edges to remove burrs. Lengths of pipe chosen were those with a connection on one end.

Tight hose-pipe connection is insured by clamping.—*Charles H. Beadan, Production Mgr., Franklin Ice Cream, Bedford, Ohio.*



Cushions Wear on Chain Conveyor

Equipment deterioration resulting from drag of chain conveyor over the channel of the frame is often the cause of excessive repairs and costly down time. Greatest wear appears around the radius of the conveyor stand—(A) in sketch—where the sprocket wheel changes the direction of conveyor chain. This rounded surface wears as much as ⅜ in. in 3 to 4 months' time.

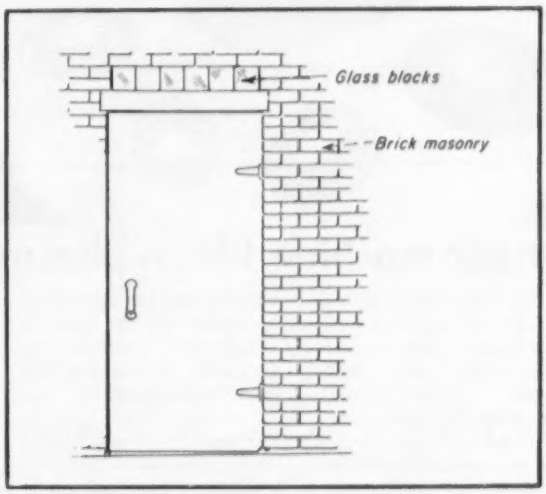
Often worn surfaces in the channel of the conveyor-stand need to be rebuilt by welding twice a year.

This inefficiency of conveyor operation was overcome at Pepsi-Cola Bottling Co., Reading, Pa., by installation of specially processed nylon wear-strips placed between the plates of the chain conveyor and the channel (see arrows in photo) to eliminate metal-to-metal contact. The strips serve as a continuous cushion between the stainless steel chain (B) and the U-channel within which it rides. No wear of nylon or metal surfaces has been noticeable after eight full months of operation.

Previous installations of these nylon strips, engineered from extruded stock, obtained from the Palmer Corp. of Pennsylvania, Reading, Pa., have demonstrated a service life of at least three years. The wear-strips are now made from a special formulation known as "Nylatron GS", which incorporates molybdenum disulphide as an additive to nylon. Strips measure 4 ft long, 0.125 in. thick, ¾ in. wide and are easily assembled into linking units (C) for passing through the channel housing with nylon rivets and Tinnerman nuts. A ¼ in. gap is left between each linking section to allow for hygroscopic expansion and stretch.

Material has a very low coefficient of friction and excellent wear-resistance against stainless steel. As a result, a smoother chain action is assured and the amount of power required to run the conveyor is reduced. Furthermore, operating noises are cut down.

These strips, resistant to soap solution and fungus as well as completely immune to rust and corrosion, are reported to cost less and yet outlast stainless steels and other special metal alloys.—*F. E. Staff.*



Easy Way to Light Storage Room

Storage rooms in food plants are usually built without outside windows and must rely on artificial light. Providing light was solved by Torrington Creamery, Torrington, Conn., with a rather unique construction idea.

Six glass blocks were put over the lintel of the outside

CAN YOU USE $50?

Then here's an opportunity to get it.

Send one of your ideas to FOOD ENGINEERING.

Each month $50 is presented to some one like you for the best item in this department. And the chance that it will be you is now running about one in twelve.

Also $5 to $15 is paid for each contributed item used. So a few minutes time may net you as high as $65.

Just send us the facts about your idea and its application. And include a free-hand sketch or snapshot to illustrate it.

We'll do the finished writing and drawing for you.

Send it today, before you forget. Address it to Practical Ideas Editor, FOOD ENGINEERING, 330 W. 42nd St., New York 36, N. Y.—The Editors.

DECEMBER PRACTICAL IDEA WINNER was "Compressor Serves as Pre-Heater" sent in by Edwin D. Mann, plant foreman, Queens City Poultry Co., Allentown, Pa.

is for the new "Stellar Series" Superhomo

NEW Perm-Align cylinder block

NEW wider capacity ranges

NEW longer wearing valve seating surfaces

NEW Elgalloy valve springs

Longer machine life . . . plus more efficient homogenization

You see here Cherry-Burrell's exclusive replaceable valve caps whose high-speed shearing action cuts fat globules down to equal size. Backed by steady pump pressure, this action assures even particle dispersion throughout any product . . . prevents globule separation back to "pre-homogenized" state.

With a new "Stellar Series" Superhomo, you'll pay *less* for more efficient homogenization. *Less* because perforated caps absorb 98% of valve wear, save plug and seat regrinding. *Less*, too, because you'll use lower operating pressures—cut down peak load demands, reduce wear on moving parts. *Less* because Stellite suction and discharge valve seating surfaces are available for extra long wear.

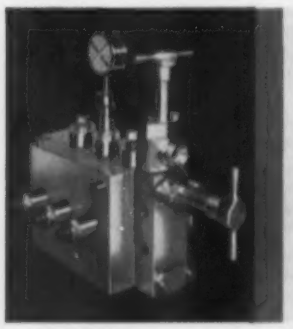
Ask your Cherry-Burrell Representative about the new "Stellar Series" Superhomo. Ask him also about our free laboratory testing facilities, about our low-rental units for test-it-yourself programs.

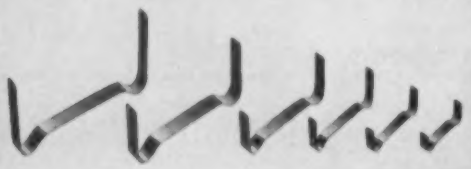
CHERRY-BURRELL CORPORATION

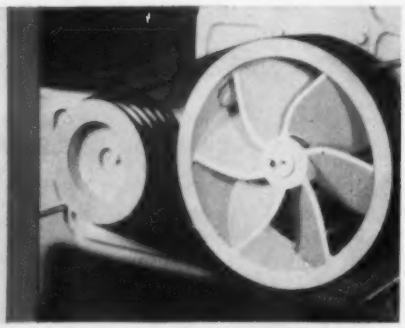
427 W. Randolph Street, Chicago 6, Ill.

Dairy - Food - Farm - Beverage - Brewing - Chemical - Equipment and Supplies

SALES AND SERVICE IN 58 CITIES . . . U.S. AND CANADA





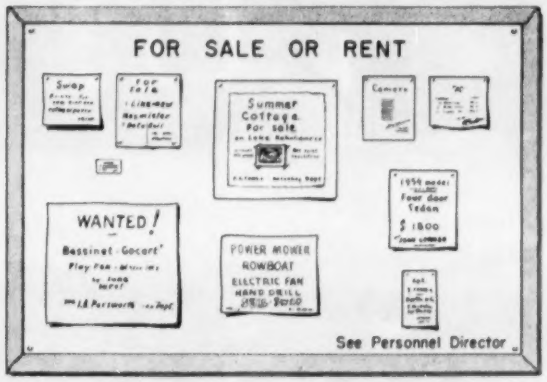


Perm-Align Cylinder Block keyed to power frame assures horizontal alignment of block and plungers.

Elgalloy Valve Springs—the same material used in Elgin watches. Special sanitary, patented stainless springs designed for rough service. Strongest, most durable homogenizer valve spring material known.

Vari-Range Drive—Capacities can be varied within limits of plunger capacity range by changing motor pulley and possibly drive belts.

door of the storage room in place of the usual brick masonry. These let in ample light to make working conditions much more pleasant. Glass blocks do not sweat even on warm days.—*Cherry-Burrell Corp., Chicago, Ill.*



"Trading Post" for Employees

A swap board is the latest thing at Atlantic Gelatin. It's a new board placed beside the main bulletin boards outside the locker room and is to be used for posting notices from employees on items they want to swap, sell or buy. This trading post is the result of an employee suggestion approved by the Suggestion Plan Committee.

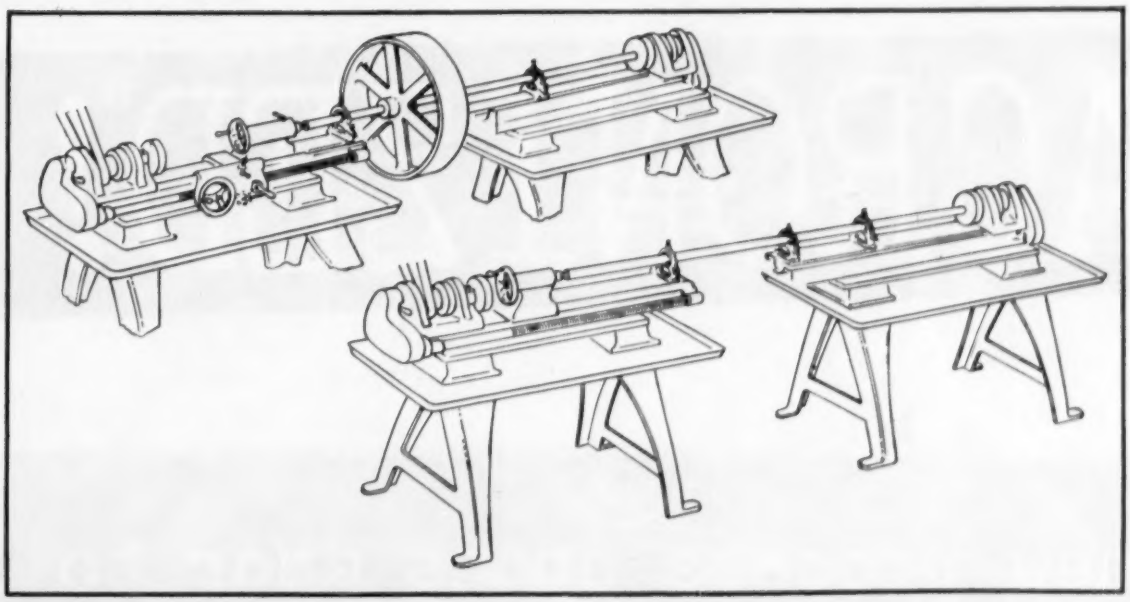
While such swap boards are a convenience to employees, management at Atlantic Gelatin knows they sometimes get out of hand—get cluttered or end up being used for other purposes. To prevent any abuse of the swap board, these rules have been set up:

- The board may be used for advertising only personal belongings and not for advertising articles or services sold commercially.
- Description of articles wanted or for sale must be written on a standard form available from the Personnel Department.
- No direct posting on the board is possible. Each notice must be submitted to Personnel, where it is approved and put up by that department.
- The time limit on how long a notice can stay on the board is one week.
- All transactions stemming from board notices are the personal affairs of employees, and the company can take no responsibility for articles advertised.—*A. Carl Holberg, Atlantic Gelatin Div., General Foods Corp., Woburn, Mass.*

Prevents Load Shift in RR Cars

When products such as milk powder and dry milk solids are packed in fiber drums or barrels, shifting in the railroad car can cause considerable damage.

One effective means of anchoring containers in place and keeping the load tight is through the use of discarded truck tires. These often collect in numbers at plants using trucks for pickup or delivery, so utilizing casings to prevent damage in shipment may also prove a good riddance.—*Ruben Eirschele, Manager, Constantine Coop Creamery Co., Constantine, Mich.*



Big Jobs on Small Units

Our two 16-in. lathes were ample for normal maintenance and repair on small items in our cotton seed oil plant. On occasions, however, emergencies required work that could only be accomplished on a much larger lathe. Therefore, when it was necessary to face large pulleys or turn long shafts, we found ourselves in trouble, especially since our plant is not located near adequate facilities.

We solved this problem by mounting our two lathes (see sketch) with their centers in one line, thus making the bed of one the continuation of the other. Between the two we left a space of approximately 36 in. to enable us to work on lengths of shaft as long as five yards between the two centers of the lathes. For this purpose we adapted an old counter-center working in reverse.

In the space between the beds we are now able to work on items with diameters much larger than the 16 inches to which we were limited by the small presses. To hold the large items we use a shaft plus fixture on one lathe and a tool support on the other.—*Hans H. Werthauer, engineer, Sanbra, Sao Paulo, Brazil*

...in the big ACRONIZED*!

new process opens door to

*ACRONIZED *is a trade-mark of American Cyanamid Company*

poultry...

news is

NOW, AT LAST, you can deliver "fresh-killed" flavor and quality right into the consumer's home!

For today, pre-packaging of poultry has become a reality with *Acronized*—the amazing new process that retards the growth of spoilage bacteria and prolongs freshness under conditions never before possible.

Acronized is the first Government-accepted process to bring you the food preserving benefits of American Cyanamid Company's antibiotic *chlortetracycline* . . . and is backed by years of research and testing.

It makes pre-packaging possible by ending the usual "incubator effect", and preserves freshness without changing the poultry's color, odor or taste.

In addition, Acronized gives you these marketing advantages:

- Protects you against delays in transit
- Opens new and more distant markets
- Reduces frequency of delivery
- Increases volume to present accounts, who can now safely carry full inventories
- Levels out peaks and valleys in your production

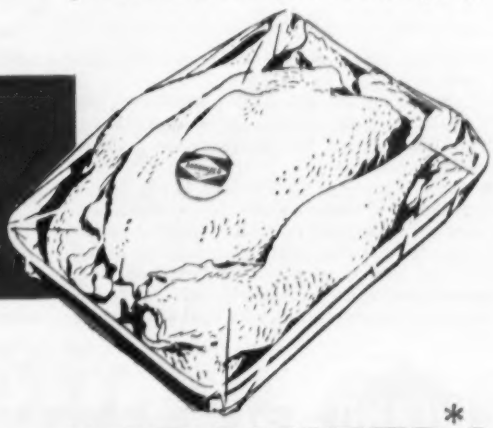
Yet Acronized requires virtually no change in your processing routine! You simply add Acronized solution to your chill tanks, and bacterial growth on the birds is retarded from that point on.

NATIONAL PUBLICITY is telling America's housewives about Acronized chicken. Now is the time to identify your poultry with this history-making advance.

Write today for details on how your plant may qualify for the Acronized franchise.

AMERICAN Cyanamid COMPANY Fine Chemicals Division
30 Rockefeller Plaza, New York 20, N.Y.

pre-packaging



the freshest poultry is ACRONIZED*!

For more data, circle this page number on card at back →

"Another Product Safely Shipped in Inland 'protection-eered' Containers"*

MAKING COCONUT OIL FEEL AT HOME

Nature's package for coconut oil in the raw state is just about perfect . . . tough and sanitary.

But packaging *refined* coconut oil is another matter. Fatty acids in the oil react with steel to cause contamination and discoloration. Yet steel containers are most practical and economical.

In licking this problem for The Best Foods, Inc., a leading processor of vegetable oils, Inland Steel Container specialists managed to duplicate, and even improve upon, Mother Nature's packaging with a steel container that has: (1) a special sanitary lining that eliminates all possibility of contamination, (2) an attractive, functional design together with rigid construction that takes even severe handling in stride, (3) a simple, efficient cover that's not only more airtight and leakproof than a coconut but much easier to open.

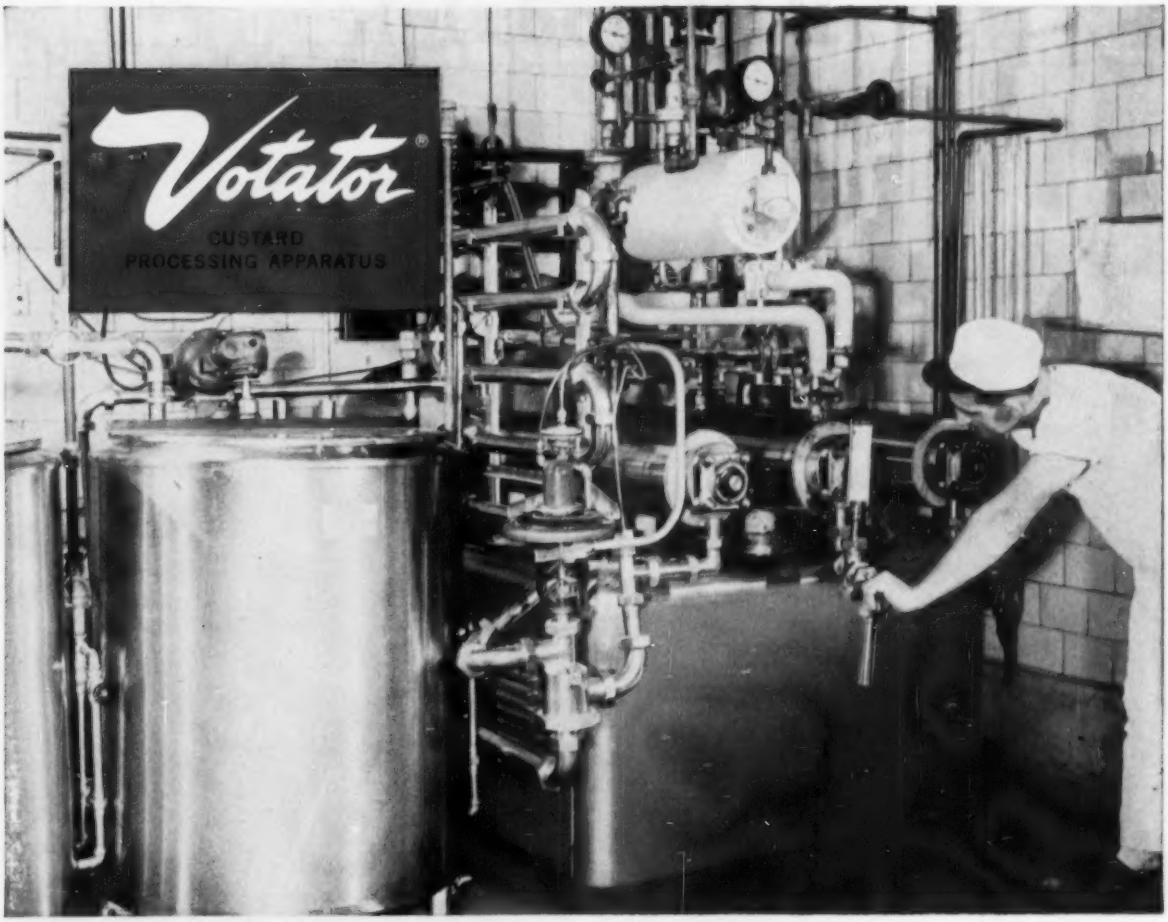
The Best Foods, Inc. specifies Inland containers with special sanitary linings for their Nucoline brand coconut oil. They've found through years of satisfactory shipping of many products that Inland containers can be depended on to deliver the same high quality they maintain so carefully in production.

If you'd like to find out how steel packaging by experts can insure quality-on-delivery and save you money too, write today to Mr. Robert Boecher, Room 243-B.

"It's better to ship in steel."

**the right container, with the right lining for your products.*

INLAND STEEL CONTAINER COMPANY
Division of Inland Steel Company
6532 South Menard Avenue • Chicago 38, Illinois
Plants: Chicago • Jersey City • New Orleans



COOKS PASTEURIZES COOLS in one continuous operation

● VOTATOR* Processing Apparatus provides these benefits in the making of pie filling:

Precise uniformity. Hour after hour, day after day . . . custard products are of perfect consistency and flavor, due to accurately controlled temperatures, uniform mixing at all stages, totally enclosed system.

High output. One VOTATOR Processing Unit can supply the total custard demands of a large bakery. Eliminates waste. Processing is continuous, automatic.

Improves working conditions. Eliminates heat of open-kettle operations. Saves floor space. Improves appearance.

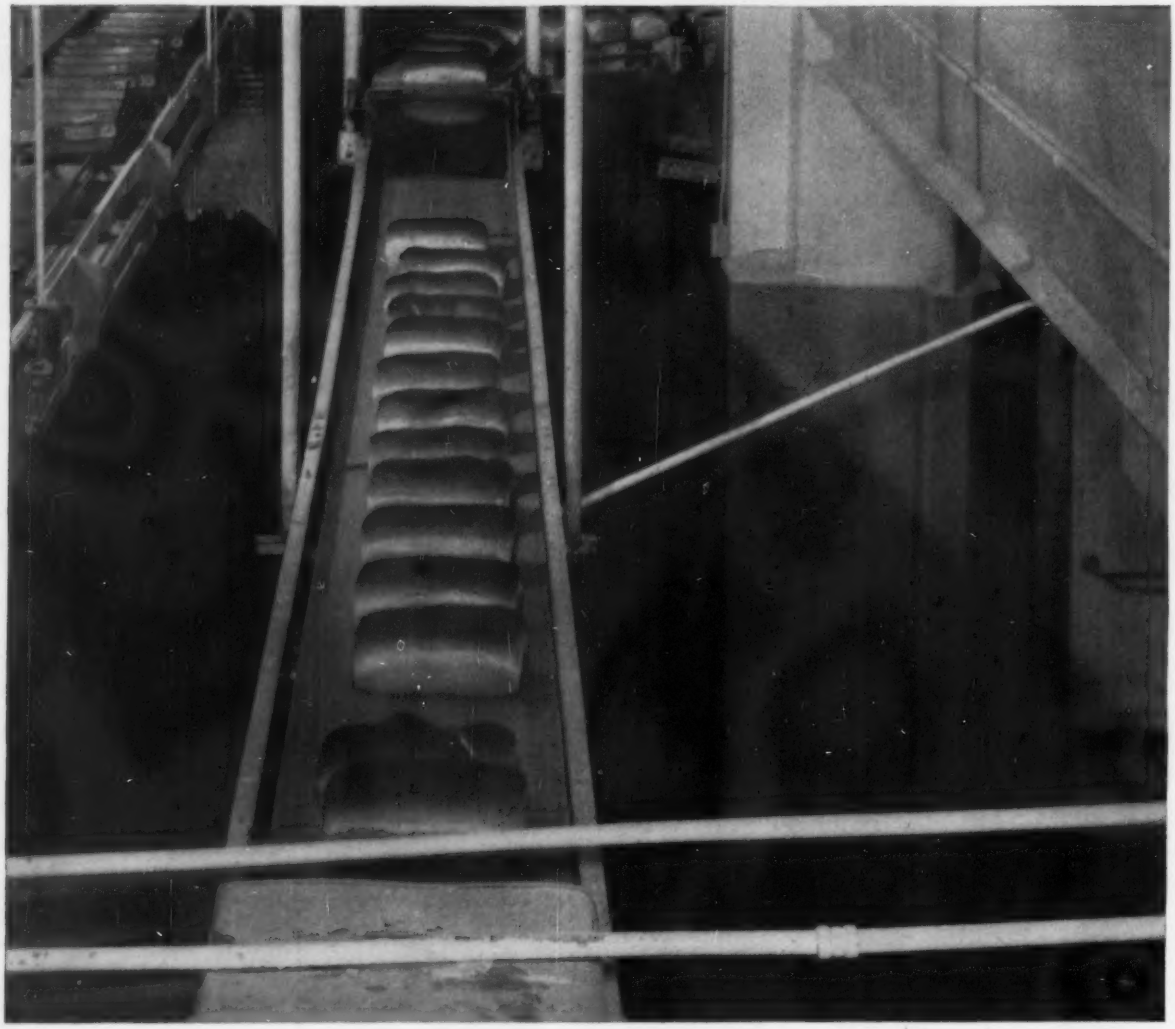
Find out how you can improve pie filling, wafer batter, sandwich creme, cake batter and marshmallow with VOTATOR Processing Apparatus. Write our nearest office today.

*VOTATOR—Trade-Mark Reg. U. S. Pat. Off.

the GIRDLER Company

A DIVISION OF NATIONAL CYLINDER GAS COMPANY
LOUISVILLE 1, KENTUCKY
VOTATOR DIVISION: New York, Atlanta, Chicago, San Francisco

RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER



B. F. Goodrich belt lasted 7 times longer in hot bread service

THAT belt the bread is riding on is the most useful conveyor belt made for the food industry. It's the B. F. Goodrich Highseal, built to handle 85 out of every 100 food-handling jobs, and to last longer doing them.

In this bakery, for instance, the belts previously used on this job average only 90 days' service. The combination of oil and heat would soften the belts. Then the fasteners would pull loose, causing a shutdown for repairs at least once a week. Switching to a Highseal belt solved this problem. It's already lasted over two years—7 times longer than previous belts—and is still going strong.

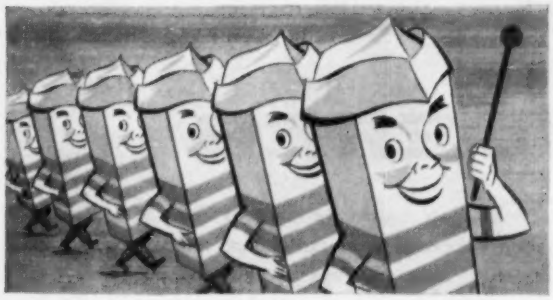
A new rubber compound gives this B. F. Goodrich belt good resistance to food acids, most greases, fats and alkalies. It can handle cold products down to zero, as well as hot ones up to 212°. Food particles can't grind into Highseal's smooth, polished surface. That's why it's so easy to clean. Oily foods, sticky icings, even scuff marks from banging pans, wipe right off with a damp cloth.

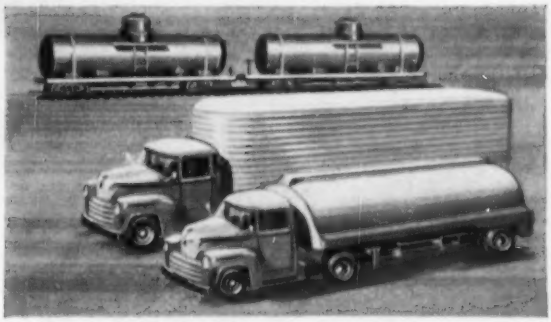
Probably the first thing you'll notice about the Highseal belt is its attractive green color. Lighting experts call it "eye-rest" green, and the contrasting color makes it a great improvement over dark belts for the inspection of baked goods and most fruit and vegetables.

Find out more about this longer-lasting, work-saving belt for food handling. Let your B. F. Goodrich distributor show you a sample and give you further information. *The B. F. Goodrich Company, Dept. M-557, Akron 18, Ohio.*

B.F.Goodrich
INDUSTRIAL PRODUCTS DIVISION

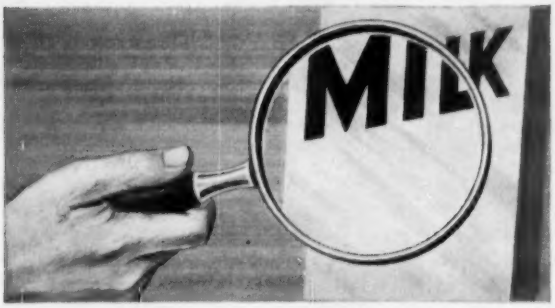
New Wax-Polyethylene Blends Greatly Improve Dairy Cartons





New Blends Contain A-C* Polyethylene

Suppliers of dairy waxes are now fortifying wax with A-C Polyethylene, giving the dairy industry major improvements in cartons without changes in production facilities. A-C Polyethylene-wax blends are now shipped in liquid form in tank cars or trucks or in slab form. Dairy users of these pre-blended A-C Polyethylene-wax combinations report many product and also production advantages.



Coating Improves Carton Strength

Reductions in bulging and number of leakers were the first advantages noted by many dairies. Cracking, chipping, flaking and rupture are all diminished when the smooth, pliant coating is applied. A-C Polyethylene-wax blends offer higher tensile strength than ordinary wax coating.

Appearance Also Improved

Color and general brightness of the carton are improved. The new blends give more uniform and more homogenous coating on bottom and sides. Printing stands out, the appearance of your product is enhanced. Dairies everywhere have found that A-C Polyethylene-wax blends are superior. Ask your wax supplier for this fortified wax blend today!

Production Problems Reduced

A-C Polyethylene-wax blends are easy to use without changes in waxing equipment. Some users even report increased coverage per pound of wax. Containers are easier to process because of reduced wax accumulations on filler section runners. Machinery stays clean, thereby reducing maintenance.

Blends Are Ready To Use

A-C Polyethylene-wax blends are available in quantity from dairy wax suppliers. Millions of dairy cartons are coated every day with A-C Polyethylene-wax blends.

Ask your wax supplier about A-C Polyethylene or mail in coupon for more information.

*Trade-mark

Allied Chemical

A-C* Polyethylene

SEMET-SOLVAY PETROCHEMICAL DIVISION
Allied Chemical & Dye Corporation
Room 552
40 Rector Street, New York 6, N. Y.

☐ Have my local supplier furnish information on the advantages of A-C Polyethylene-wax blends.

Name _____

Title _____

Company _____

Address _____

City _____ Zone _____ State _____

For more data, circle this page number on card at back →

You're sure to be in

GOOD TASTE

when you specify

UNGERER

IMITATION PISTACHIO FLAVOR NO. 594

Another top quality product of the Ungerer laboratories. Samples and technical information on the use of this flavor in your product will be supplied on request.

Plant and Laboratories, Totowa, New Jersey

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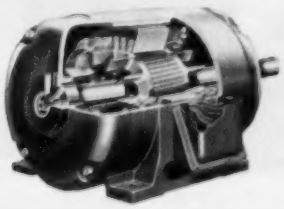
161 Avenue of the Americas, New York 13, N. Y.

CHICAGO • BOSTON • PHILADELPHIA • ST. LOUIS • LOS ANGELES • ATLANTA

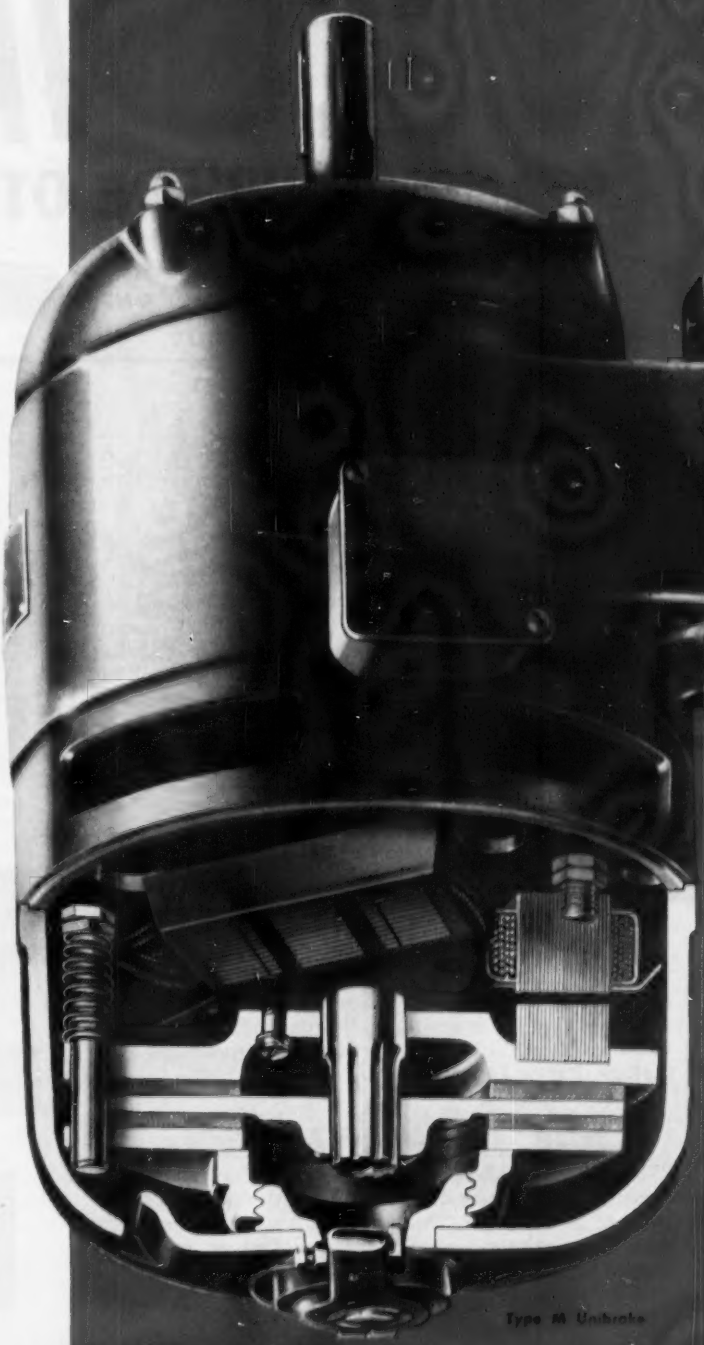
TWO WAYS...with Master Unibrakes

STOP-HOLD—Master Type M Magnetic Unibrake Motors. For quick, controlled stopping—especially when you want to hold the load. Spring-setting magnetic release brakes of the friction disc type combine with motor in a compact, integral unit. Sizes—⅛ to 150 H.P.

ROLLING STOP—Master Type D Dynamic Unibrake Motors. Braking is obtained with a unique, patented brake winding superimposed on the stator winding. Simple, compact, with no DC current required, the brake has no moving parts. There is nothing to wear or adjust—braking torque repeats consistently. Particularly recommended for automatic applications which do not require static holding. Sizes up to 30 H.P.



MASTER GEARMOTORS and variable speed drives can be supplied with integrated Unibrakes too. See Master for the perfect power drive for you.



Type M Unibrake

MASTER

THE MASTER ELECTRIC COMPANY
DAYTON 1, OHIO

UNIBRAKE MOTORS

On-The-Job Proof!

LQ600 VALVES

STAND UP WHERE OTHERS FAIL!

In four years of actual field tests, conducted by nearly 100 cooperating companies, NOT ONE LQ600 VALVE HAS EVER LEAKED OR FAILED.

LQ600
150 lb. S.P.
300 lb. W.O.G.

CHEMICAL PLANT

"LQ600 is still tight after three years on a very tough 150 lb. steam service installation where competitive valves used to leak in 2 weeks to 2 months."

MEAT PACKER

"We are writing to let you know how pleased we have been with the LQ600 Valves we put on our toughest lines. We installed these valves in three of the most difficult locations in our plant and have had trouble-free operation ever since they were installed."

HOSPITAL

"LQ600 is still tight and functions perfectly after 31 months of service on a water column blowdown installation where competitive valves failed by wire drawing in two months."

DISTILLERY

"An LQ600 Valve was installed for throttling service on a syrup line at 140°F. After 9 months the valve was removed for inspection. It was tight and in perfect condition. This valve was put into another test installation and is still tight."

DAIRY PLANT

"The LQ600 Valve was installed more than three and a half years ago on a steam line with rust and scale present at all times. This valve has withstood service conditions where others were replaced on an average of once a year due to seat and disc erosion."

* Patented Alloy

WRITE FOR Circular 602, a new four-page bulletin on the LQ600 Valve. Request it from your Lunkenheimer Distributor, or write The Lunkenheimer Company, Box 360, Cincinnati 14, Ohio.

LUNKENHEIMER®

THE ONE *Great* NAME IN VALVES

L-855-15

FILTERAIDS

Paul W. Leppla, Technical Director

If your process includes a step where suspended solids – too fine to separate by settling – require removal from a liquid, filteraids may provide a solution to your problem. Chemical Engineers frequently fail to recognize potential filteraid applications, due probably to lack of familiarity with these materials.

Although there is no single typical application, a common characteristic of systems where filteraids are useful is the presence of suspended solids of natural origin, which cannot readily be characterized as to chemical composition or particle size. In fact, if you have a process liquor with less than 10% of particulates that settle out with difficulty, and whose exact nature and composition aren't known, the chances are very good that diatomite filteraids can be your answer.

In many cases the troublesome solids may be removed on a laboratory scale by filtration through fine cloth or filter paper, but the rate of filtration is reduced so rapidly by the deposition of an impervious layer of slimes, that a plant scale filtration operation operated on the same basis simply is impracticable.

The filtration engineer recognizes this situation as a "natural" for the use of a filteraid. Filteraids may be used with a variety of types of filtration equipment. The classical scheme provides for the addition of a small percentage of diatomite filteraid to the solution ahead of the filter. This is easily handled by the use of a simple proportioning feeder device.

Because of its unique porosity the diatomite "opens up" the layer of slimes as it is forming to such an extent that the flow is not choked off as the cycle progresses, and the volume of filtrate is increased a hundred-fold or even more.

The method of filteraid filtration offers the chemical engineer a process tool for clarification that is economical in first cost, operating cost, and maintenance. Cost varies depending upon the application, but filteraid addition frequently is in the neighborhood of 0.05%. Since filteraids cost 2-5 cents per pound, costs often fall into the range of 8-20 cents per thousand gallons filtered. In the clarification or polishing of relatively clear liquids, filteraid cost may fall below 1 cent per thousand gallons.

Dicalite Filteraids can give Increased clarity!

This is really an odd one. It started with a bottle of distilled water in a Dicalite laboratory, tight-stoppered in a sterile container. For certain reasons we had cause to question it. So we filtered it, using the finest grade of Dicalite filteraid—and removed microscopic solids which had survived distillation!

While this was a laboratory matter, it is of real importance to every man concerned with the clarification of process liquors, or with the separation of finely divided solids from liquids. If you require filtration so "sharp" that it will trap better than 95% of bacteria and other submicron-sized solids, there are Dicalite filteraids that do just that. Other Dicalite filteraids give faster flow-rates, yet still yield filtrates of sparkling clarity. No matter what your standard of clarity, there is a Dicalite filteraid which will meet it, or surpass it. We will be glad to advise with you on your particular process problems. Write us!

25 Dicalite

Dependable GLC GREAT LAKES Dicalite® DIATOMACEOUS MATERIALS

DICALITE DIVISION • GREAT LAKES CARBON CORPORATION, 612 SOUTH FLOWER STREET, LOS ANGELES 17, CALIFORNIA

Because...

the best products you can make depend on the best ingredients you can buy...

LOOK TO Sterwin FOR-

VITAMINS

Essential vitamins by *STERWIN* U.S.P. . . . in bulk and specially prepared carriers . . . quick delivery . . . any quantity, any time. Quality control under constant direction of experienced specialists assures potency, purity, dependability of *each individual batch.*

Parakeet® CERTIFIED F.D.& C. COLORS

A complete line of pure colors. Leaders in basic color field for more than 25 years. *PARAKEET COLORS* add eye and sales appeal to many famous food and drug products. Carefully controlled manufacture, rigid laboratory testing guarantee top quality colors. Any shade or color combination desired can be produced.

For Further Information on Sterwin Products Write!

ZIMCO® U. S. P. VANILLIN

Made by world's largest producer of Vanillin. Exquisite flavor and delectable aroma. *Pure* . . . only U.S.P. pure crystals, giving true, vanilla-like flavor. *Soluble* . . . dissolves quicker due to uniform crystalline structure. *Uniform* . . . flavor never varies—use *ZIMCO* as a standard in determining your formula. *Availability* . . . unlimited supply of basic material—ample plant capacity.

STERWIN HELPS STOP YOUR SANITIZING PROBLEMS with ROCCAL®
The Original Quaternary Ammonium Germicide. Provides industry with an effective germicide that is laboratory controlled and tested.

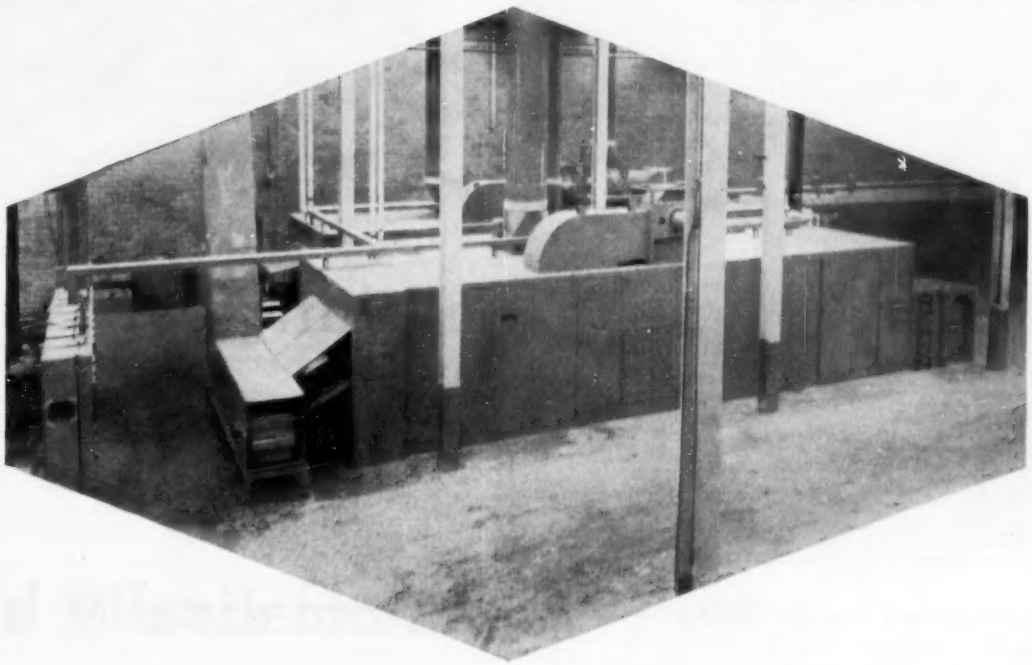
STOCKED FOR QUICK DELIVERY AT:
Atlanta, Buffalo, Evanston, Ill., Dallas, Kansas City, Mo., Los Angeles, Portland, Ore., St. Louis.

Sterwin Chemicals INC.
Subsidiary of Sterling Drug Inc.
1450 BROADWAY, NEW YORK 18, N. Y.

A

Proctor

DRYING RANGE means a PROFIT!



Efficient drying per pound of product can often *mean more direct profit to you* than an increased sales volume! Proctor equipment provides the control, flexibility, and construction features *essential* to profitable drying performance. The result—increased yield of highest quality product. Write or phone *today* for complete information.

Product Uniformity is of utmost importance to every food processor, at all stages of processing.

Shown above is one of many Proctor & Schwartz dryer installations in one of the country's larger food plants—typical of the many in use in the food industry today. Here, because of Proctor drying skills, uniformity of color, taste, and overall customer appeal is maintained at uniformly highest levels—yields are greatly increased!

★ HIGHEST PRODUCT UNIFORMITY
★ INCREASED YIELD
★ GUARANTEED PRODUCT QUALITY
★ "W/M" CONSTRUCTION
★ FLEXIBILITY OF OPERATION

PROCTOR DRYING EQUIPMENT FOR THE FOOD AND PROCESS INDUSTRIES

- Tray Dryers
- Truck Dryers
- Pre-Forming Feeds
- Continuous Conveyor Dryers
- Spray Dryers

Proctor

PROCTOR & SCHWARTZ, Inc.

Manufacturers of Industrial Drying Equipment and Textile Machinery, Philadelphia 20, Pa.

For more data, circle this page number on card at back →

MODERNIZING?

New equipment needs the right instrumentation

When you're planning to install new equipment, plan to take advantage of the full potential of modern methods of measurement and control. It's the sure way to get top value for your modernization investment . . . for the improvements in production economy, quality, and versatility possible with today's production equipment depend increasingly on control instrumentation.

Here are two important points that deserve consideration if you're planning to modernize:

1. ***Design for control.*** Instrumentation is more than a necessary appendage. It's a vital, integrated part of the process itself. *Control design goes hand in hand with process design.*

2. ***Get the right instrument for the job.*** This seems obvious—but all too often instruments may be stretched or squeezed to fit applications for which they were never intended. *Each instrument should fit its function.*

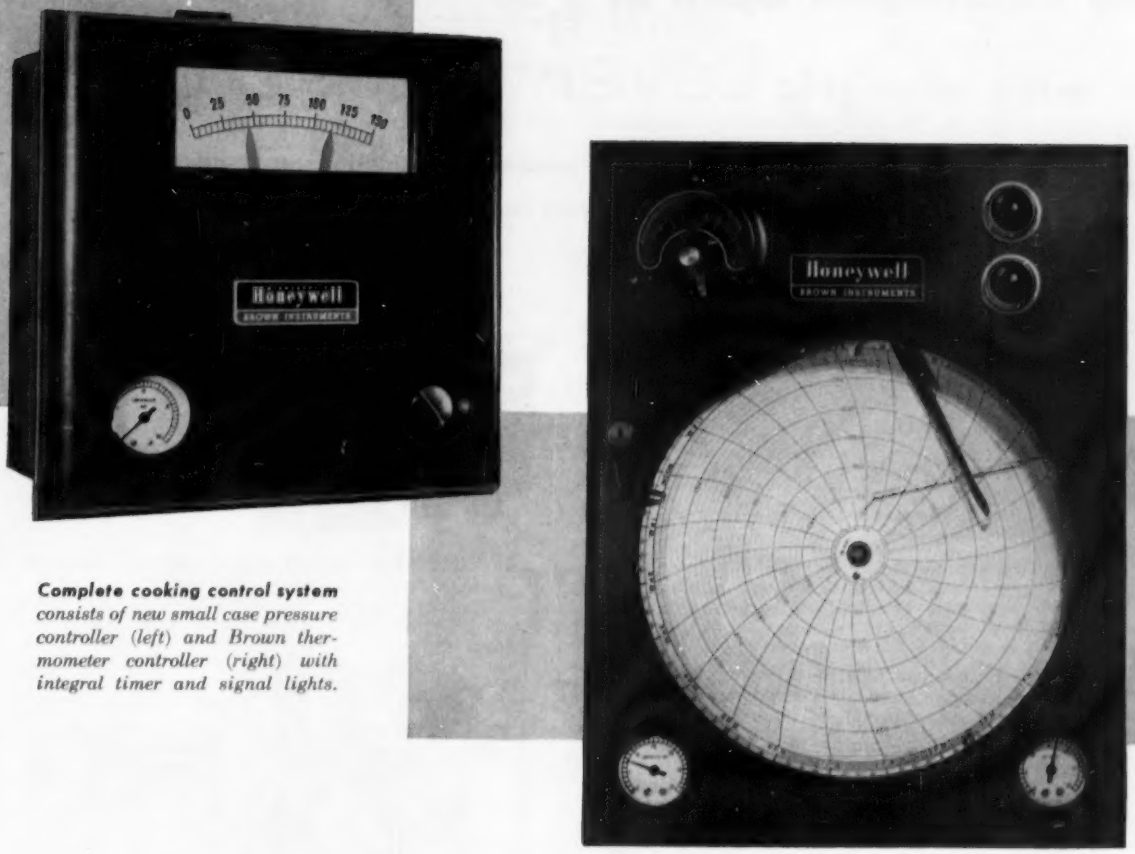
On point number 1, Honeywell's experienced application engineers will be glad to cooperate with your own staff to recommend ways in which you can obtain the full benefit of modern instrumentation. They have an extensive background not only in contact technology, but also in the processing problems of various industries.

On point number 2, Honeywell offers an exceptionally wide line from which to choose. You're sure to find instrumentation with exactly the right performance . . . at the right cost . . . to fit your process. You eliminate problems of "shopping around" . . . and divided responsibility. This one source can fill practically all your measurement and control requirements.

A talk with your nearby Honeywell sales engineer will give you a detailed picture of what instrumentation can mean in your modernization program. Call him today . . . he's as near as your phone.

Canning and cooking cycles controlled automatically by

For information on the varied line of ***ElectroniK*** *instruments applicable to food processing operations, write for your copy of Catalog 1531,* ***"ElectroniK*** *Controllers."*



Complete cooking control system *consists of new small case pressure controller (left) and Brown thermometer controller (right) with integral timer and signal lights.*

new Brown Control System

ONCE you have determined the best temperature cycle for cooking canned meats to top quality and uniformity . . . how do you duplicate these conditions consistently in production?

For a simple, effective answer to this problem, investigate the two Brown controllers shown here. Readily applied to your own cooking and canning equipment, they take the guesswork out of process control . . . make the whole operation completely automatic and free from human error.

Time-temperature cycles are regulated by a Brown thermometer controller with built-in timer and signal lights. You just set the control index to the temperature you want, and turn the timer dial to the number of minutes desired at temperature. The cycle starts automatically. Under control of the instrument, cooking temperature is raised to the set value, held for the prescribed time, and then the heat supply is turned off. Signal lights tell the operator when temperature is reached and when the cycle is finished. Cycle time can be anywhere from a few minutes to three hours. The instrument's chart gives you a permanent record of the operation.

For pressure control, a simple, economical instrument has just been developed for the specific needs of canners. It regulates retort pressure to prevent excessive differential pressures between the inside and outside of the can or glass jar. Especially valuable during blow-down, this instrument gives dependable protection at low cost.

These two new instruments typify the control systems which Honeywell has developed for the diversified needs of the food industry. For a personal discussion of your own plant's requirements, call your local Honeywell sales engineer . . . he's as near as your phone.

MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, Wayne and Windrim Avenues, Philadelphia 44, Pa.—in Canada, Toronto 17, Ontario.

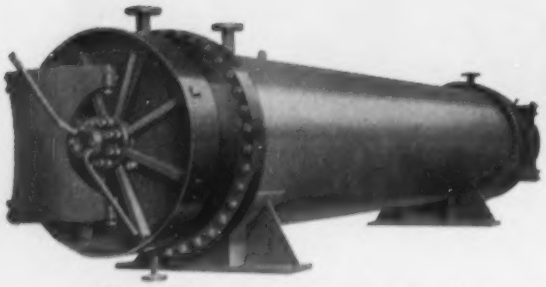
● **REFERENCE DATA:** Write for Bulletin 6440, "Thermometer with Timer and Signal Lights"... and Bulletin 7040, "New Small Case Pressure Controller."

MINNEAPOLIS
Honeywell
BROWN INSTRUMENTS
First in Controls

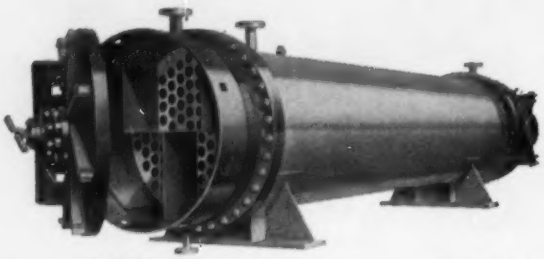
Heat Exchangers Open in 5 Seconds

with new p-k Lever-Lock Door*

Substantial savings seen for processors of high-fouling liquids and others who must clean and inspect heat exchangers regularly.



CLOSED, the Lever-Lock looks like this. A single 1/6th turn of the lever draws back the lock bars.



OPENED manually with an easy pull, the tubes and tube sheet are easily accessible.

Anyone who has had to open a heat exchanger knows how time-consuming and costly it can be. Dozens of bolts must be loosened. Specialized labor is often required.

Now these problems can be things of the past. p-k's Lever-Lock Door, available on p-k heat exchangers, provides *five-second access* to the unit—and a new approach to exchanger design. The door "unlocks" with a 60° manual turn of a lever. In horizontal position the door then swings open easily. In vertical position, it is lifted by means of a pneumatic cylinder. Either way, it seats itself automatically on a long-life, self-sealing gasket. Other features allow Lever-Lock to be used in a wide range of applications:

- **Available in all alloys**
- **Pressure range from full vacuum to 300 psi**
- **Temperatures to 400°F. (Special alloys for sub-zero applications)**
- **Mechanical lock available to prevent opening vessel when pressurized**
- **No maintenance other than simple lubrication**
- **Available in diameters from 16" through 36"**

Lever-Lock doors have been used successfully not only on p-k heat exchangers, but on p-k autoclaves and sterilizers in the chemical, textile, food processing, and rubber manufacturing industries as well. For all of them, and wherever exchangers carry high-fouling liquids or require frequent entry for cleaning and inspection, Lever-Lock doors pay for themselves through savings in time. Heat transfer can be more efficient, too, since you can afford to remove gunk more frequently.

But this is only part of the story. If you see the Lever-Lock as the answer to a perplexing problem in your plant, why not write for *all* the facts, *today?*

The Patterson-Kelley Co., Inc., 1520 Lackawanna Avenue, East Stroudsburg, Pa., and principal cities

*Pat. Pending

1. This autoclave is in vertical position with its Lever-Lock Door equipped with a pneumatic cylinder.

2. To open, operator merely gives lever a 1/6th turn that releases lock bars.

3. Door is lifted in 5 seconds—automatically! An hour or more of work is saved.

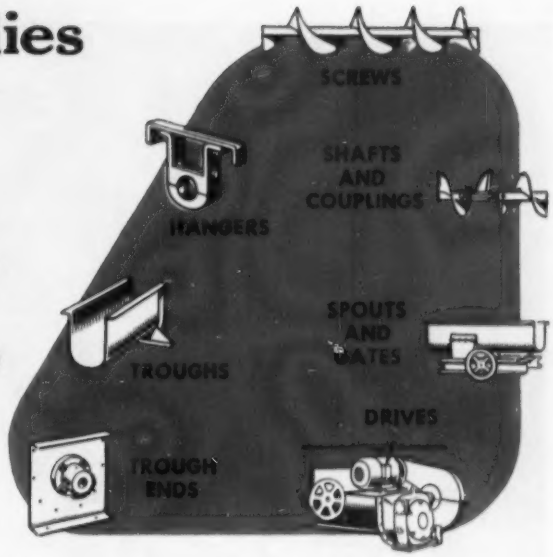
Write for new p-k Bulletin No. 2030 for full details.

PATTERSON-KELLEY

2975

Offices: 101 Park Avenue, New York 17 • Railway Exchange Building, Chicago 4 • 1700 Walnut Street, Philadelphia 3 • 96-A Huntington Avenue, Boston 16 and other principal cities

How Link-Belt applies STANDARD or SPECIAL screw conveyors to meet your needs



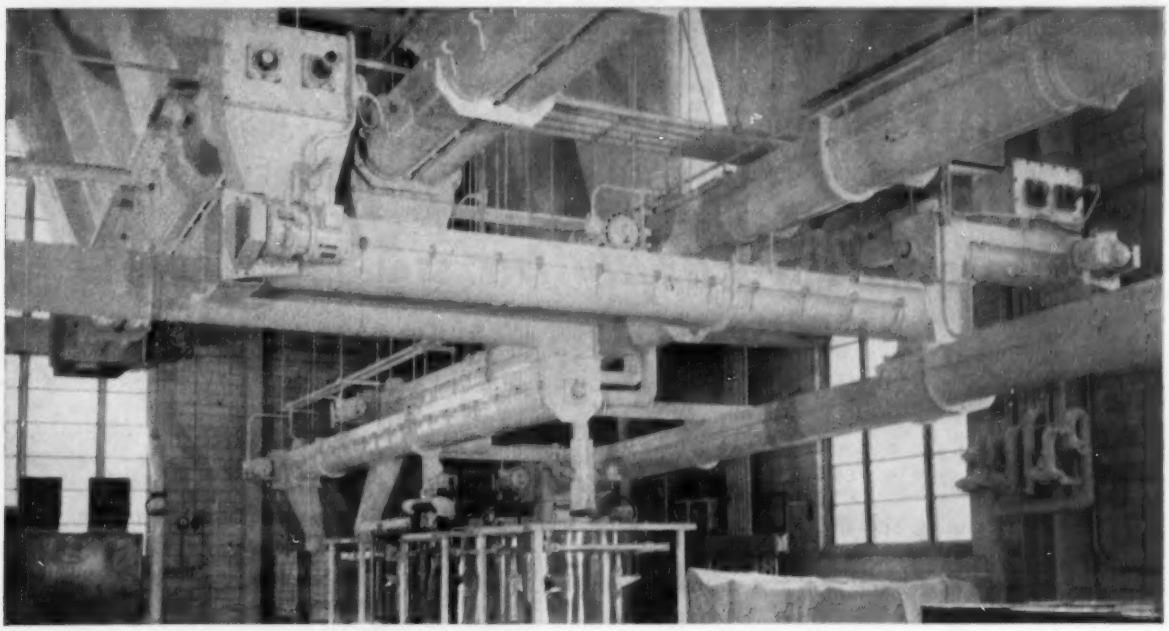
This 4-phase service saves you time . . . spares you details

ANALYSIS AND ENGINEERING service is provided by a district sales office in your area. From long experience, Link-Belt District Engineers can quickly ascertain the best conveying arrangement for you.

COMPLETE LINE OF SCREW CONVEYOR COMPONENTS and related elevating, conveying and power transmission equipment is your assurance that specific needs are fulfilled efficiently and economically.

EASY ERECTION is achieved because of pre-fitting, match marking, close-tolerance manufacturing and Link-Belt drawings. Link-Belt will handle erection if you wish.

SATISFACTORY PERFORMANCE is assured when you rely on Link-Belt as a single contract source for your complete system. We will accept full responsibility for placing it in operating readiness.



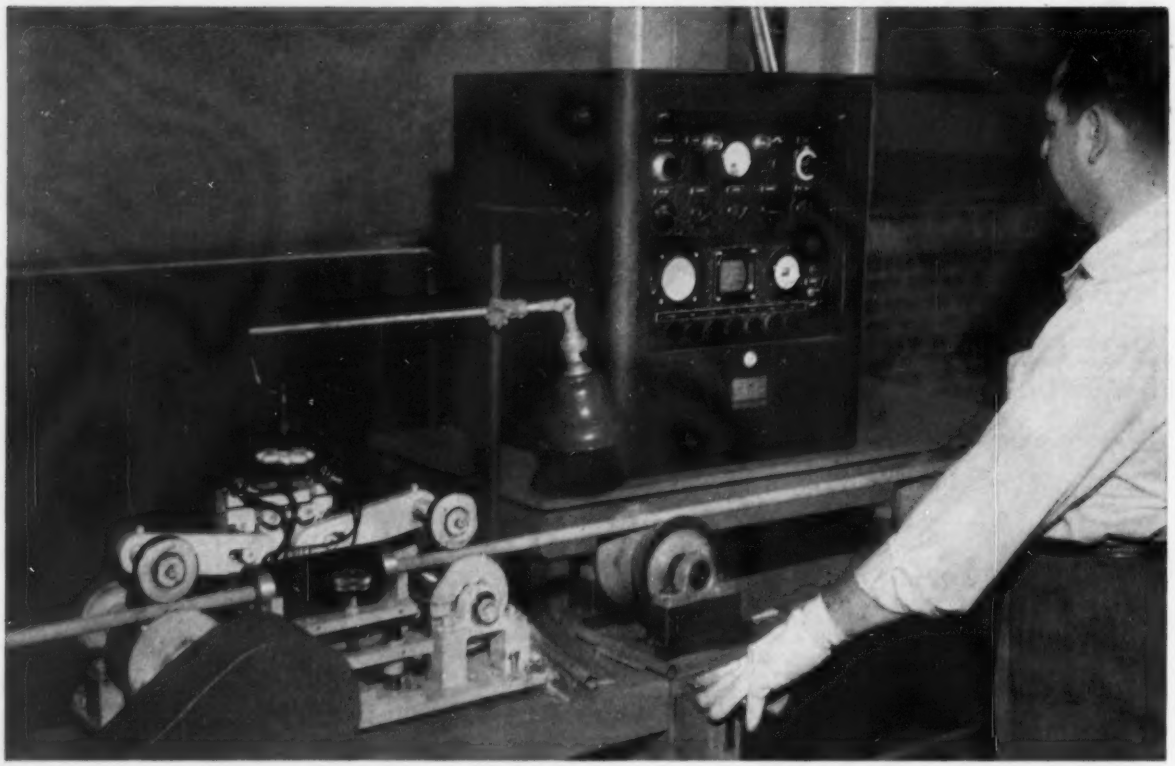
At Midwest bakery, Link-Belt twin screw feeders and screw conveyors provide sanitary handling of sugar and flour to bins and sifters.

Extensive engineering experience has provided Link-Belt with standard solutions to specialized screw conveying requirements. In addition, local availability of Link-Belt engineering service and quality components assures prompt, efficient action. That's why—whether you plan a complete new system or improvement of present arrangements—a call to your nearest Link-Belt office is a sure step to lower handling costs.

LINK-BELT

SCREW CONVEYOR EQUIPMENT

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 13,912



why this NEW "EYE"

ASSURES YOU HIGHEST POSSIBLE DEGREE OF PERFECTION IN *Carpenter* STAINLESS TUBING!

Now, minute tubing defects invisible to the human eye . . . even those not detectable by any other production non-destructive testing method, will not escape the penetrating eye of a new non-destructive test in the Carpenter mill.

It's the most exacting and thorough quality control device ever developed for testing austenitic stainless tubing during production. Flaws that don't show up in hydrostatic tests are brought to light by this new testing device as it critically scans the entire I.D. and O.D. periphery of the tubing. It also detects variations in composition, gauge, sub-surface and surface conditions at production speeds.

What does this newest Carpenter advance mean to you? It means that Carpenter now assures you of better-than-ever quality . . . the highest degree of perfection possible in stainless tubing. It means added assurance for you that Carpenter Stainless Tubing, more than ever, is your best buy for life-long trouble-free service.

Ask your Carpenter Representative or local Carpenter Distributor for more details about this new quality control measure. Specify Non-Destructive Test on your inquiries and orders.

MEMBER

The Carpenter Steel Company, Alloy Tube Division, Union, N. J.

Export Dept.: The Carpenter Steel Co., Port Washington, N. Y.—"CARSTEELCO"

Carpenter

Stainless Tubing & Pipe

ARE YOU READY TO TEST ANTIBIOTICS FOR KEEPING FOODS FRESH LONGER?

READ HOW PFIZER, PIONEER PRODUCER OF ANTIBIOTICS, CAN HELP YOU IN THIS DRAMATIC NEW FOOD DEVELOPMENT

● *Every fresh food product is in a race against bacterial spoilage.*

Despite refrigeration, despite the most sanitary processing conditions, the race goes on. It affects how far *you* can distribute and your cost of distribution; how much your dealer can stock, for how long.

DISTRIBUTION "BREAKTHROUGH" IS COMING

There's a real chance that now you can push back the time margin dividing fresh from spoiled—with antibiotics!

For a number of years thorough Pfizer research has been devoted to this dramatic development in food processing. As the world's largest producer of antibiotics, Pfizer has been able to apply a wealth of experience to developing a successful antibiotic for extending food freshness, plus the technology you need to use it.

EXPERIMENT NOW—PFIZER CAN HELP YOU

Enough comprehensive Pfizer research has now been completed to justify inviting you to make your own controlled tests with the product that has resulted from that research – PFIZER BIOSTAT.* Our technical service men can supply information and assistance.

PFIZER BIOSTAT is a broad-spectrum antibiotic product for food uses. Its chief active ingredient is a special form of oxytetracycline. *In many tests PFIZER BIOSTAT has proved extremely effective in delaying bacterial spoilage, in keeping foods fresher far longer.*

HOW WILL YOU USE BIOSTAT?

In the case of poultry PFIZER BIOSTAT has extended freshness significantly when added to the slush ice in chill tanks. Original flavor, texture and appearance were not affected in any way.

Fish packed in ice made with BIOSTAT stay fresher during long fishing runs. For further protection fillets can be dipped in a BIOSTAT solution.

Dipping, spraying, and pre-slaughter injection are all successful methods of prolonging the freshness of meats with BIOSTAT. Meat so treated not only keeps longer but also can be aged at higher temperatures to allow rapid tenderizing by its natural enzymes.

Pfizer believes antibiotics will gradually take an important place among older methods of keeping foods fresh. Test this use of antibiotics now. Mail the coupon.

*BIOSTAT is a trademark of Chas. Pfizer & Co., Inc.

CHAS. PFIZER & CO., INC.
630 Flushing Ave., Brooklyn 6, N. Y.
Branch Offices: Chicago, Ill., San Francisco, Calif., Vernon, Calif., Atlanta, Ga., Dallas, Texas

Pfizer

Manufacturing Chemists for Over 100 Years

CHAS. PFIZER & CO., INC., Technical Service Dept.
630 Flushing Ave., Brooklyn 6, N. Y.

Please send me:

☐ Technical data on antibiotics for food uses.

☐ A test sample of BIOSTAT formulated for:

_____
(poultry chill tank • antibiotic ice • other)

NAME _____

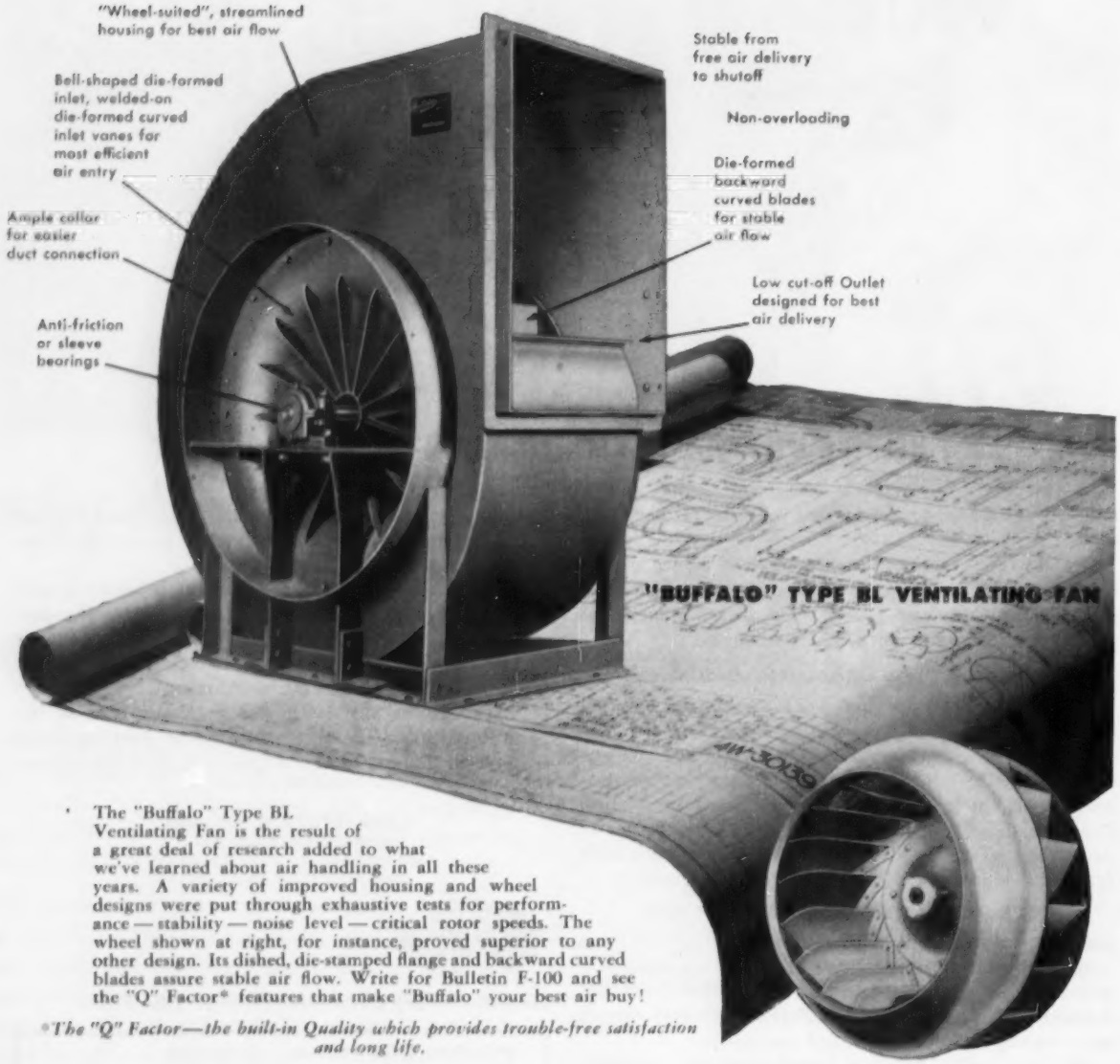
COMPANY _____

ADDRESS _____ STATE _____

For more data, circle this page number on card at back →

The Best of Our 79 Years

OF FAN ENGINEERING ARE IN IT!


"Wheel-suited", streamlined housing for best air flow
Bell-shaped die-formed inlet, welded-on die-formed curved inlet vanes for most efficient air entry
Ample collar for easier duct connection
Anti-friction or sleeve bearings
Stable from free air delivery to shutoff
Non-overloading
Die-formed backward curved blades for stable air flow
Low cut-off Outlet designed for best air delivery
"BUFFALO" TYPE BL VENTILATING FAN

The "Buffalo" Type BL Ventilating Fan is the result of a great deal of research added to what we've learned about air handling in all these years. A variety of improved housing and wheel designs were put through exhaustive tests for performance — stability — noise level — critical rotor speeds. The wheel shown at right, for instance, proved superior to any other design. Its dished, die-stamped flange and backward curved blades assure stable air flow. Write for Bulletin F-100 and see the "Q" Factor* features that make "Buffalo" your best air buy!

*The "Q" Factor—the built-in Quality which provides trouble-free satisfaction and long life.

"Buffalo"

BUFFALO FORGE COMPANY

BUFFALO, NEW YORK

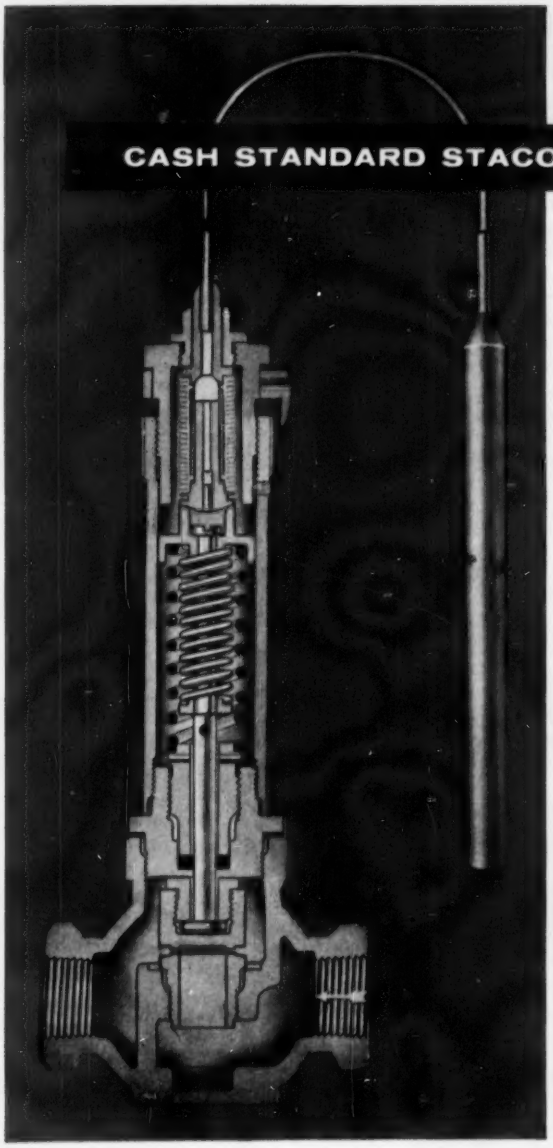
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

VENTILATING AIR CLEANING AIR TEMPERING INDUCED DRAFT EXHAUSTING FORCED DRAFT COOLING HEATING PRESSURE BLOWING

Cash Standard Expands

by the addition of

Stacon Temperature Regulators

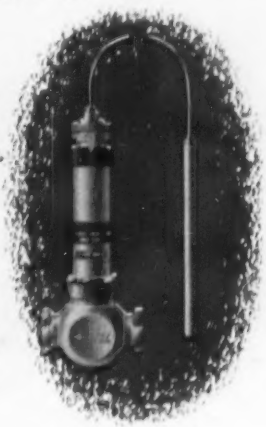


This line of temperature regulators (formerly manufactured by Farris Stacon Corp.) rounds out complete Cash Standard line of valves to solve any problem of temperature regulation or pressure control.

CASH STANDARD STACON TEMPERATURE REGULATORS

- Provide accurate temperature control for use with steam, liquids and gases.
- Self-operating and self-contained pilot-operating.
- Direct and reverse acting.
- Liquid filled thermal system for high operating power and uniform throttling action.
- Extremely compact construction with rugged field-replaceable thermostatic system.
- Overload protection to prevent overstressing of thermostatic system at over-range temperature.

Recommended for hot water heaters, tanks, kettles, plating tanks, bottle and can washers, degreasers, ovens, fuel oil heaters, brine circulating, process cooling, jacket cooling for compressors, diesel and gas engines, and many other uses.



What Is *Your* Temperature Regulation Problem?

Cash Standard has the Answer!

Contact your Cash Standard control specialist or write Dept. G.

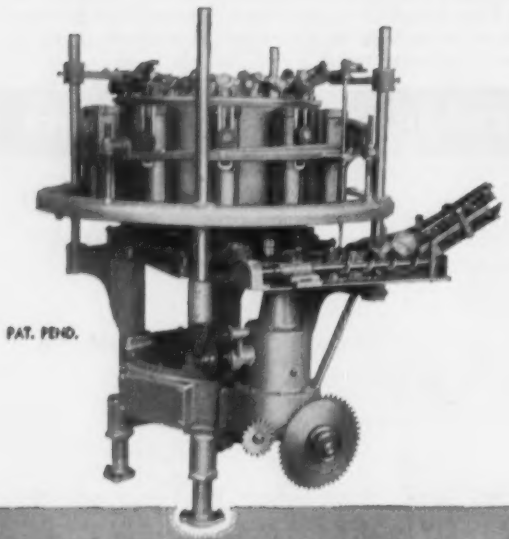
CASH STANDARD

A. W. CASH COMPANY, P. O. Box 551, Decatur, Illinois

Pressure, Hydraulic, Temperature, Process and Combustion Controls

For more data, circle this page number on card at back →

3 MORE REASONS WHY W. F. & JOHN BARNES CAN *help You* CUT FOOD PROCESSING COSTS



PAT. PEND.

LIBRASCOPE FILLERS
FEATURE HIGH OUTPUT . . . LOW MAINTENANCE COSTS

PISTON-TYPE (*shown at left: a 12-station model set up to handle dog food*) — A range of standard models are available for a variety of liquids and semi-liquids to meet production requirements from 40 to 1000 containers per minute. Units feature exclusive new Librascope self-cleaning action that prevents build-up of product on valve guides and ports — eliminates frequent cleaning operations. Plunger-type valve design maintains positive closure against leakage, assures correct filling level, and provides longer valve life. Product contacts are 316 stainless steel or non-copper alloy for utmost surgical cleanliness. Manufactured by Librascope, Inc. Exclusive distributor: W. F. & John Barnes Company.

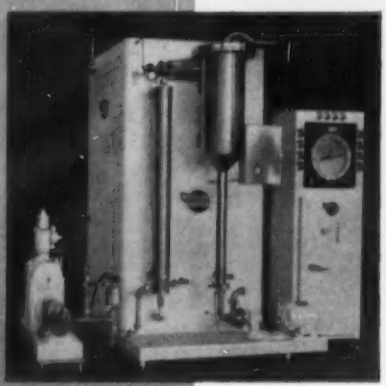
OTHER LIBRASCOPE FILLERS — Include Model G (Gravity), Model GP (Gravity Pocket), and Model PB (Bottom Fill Piston). With 6, 9, 12, 18, 27, or 36 stations.

Designed for Greater Efficiency

NEW GAS GENERATOR
NEW HEAT EXCHANGER

PAT. PEND.

◄**S-I-A GAS GENERATOR** — Compact unit provides accurate control of protective atmospheres in processing and packaging food and other products. Maintains constant, oxygen-free atmosphere to prevent deterioration and spoilage of product. Range of standard models available to meet a variety of needs for bulk or package storing, dehydration, drying, shipping, and metal, glass or plastic packaging. Manufactured by Barmotive Products, Inc. Exclusive Eastern Distributor: W. F. & John Barnes Company.



PAT. PEND.

◄**BARNES ROTO-JET HEAT EXCHANGER** — New heat exchange system utilizing steam injection for sterilizing liquid and semi-liquid products. Purified steam is transferred directly to the product without heat loss, insuring maximum efficiency and economy. Unique control system maintains processing temperatures within ± ½-degree F., and exacting instrumentation affords a balanced product moisture content. Manufactured and sold by W. F. & John Barnes Company.

Write **FOR FREE LITERATURE** — illustrates and describes these profit-making production units.

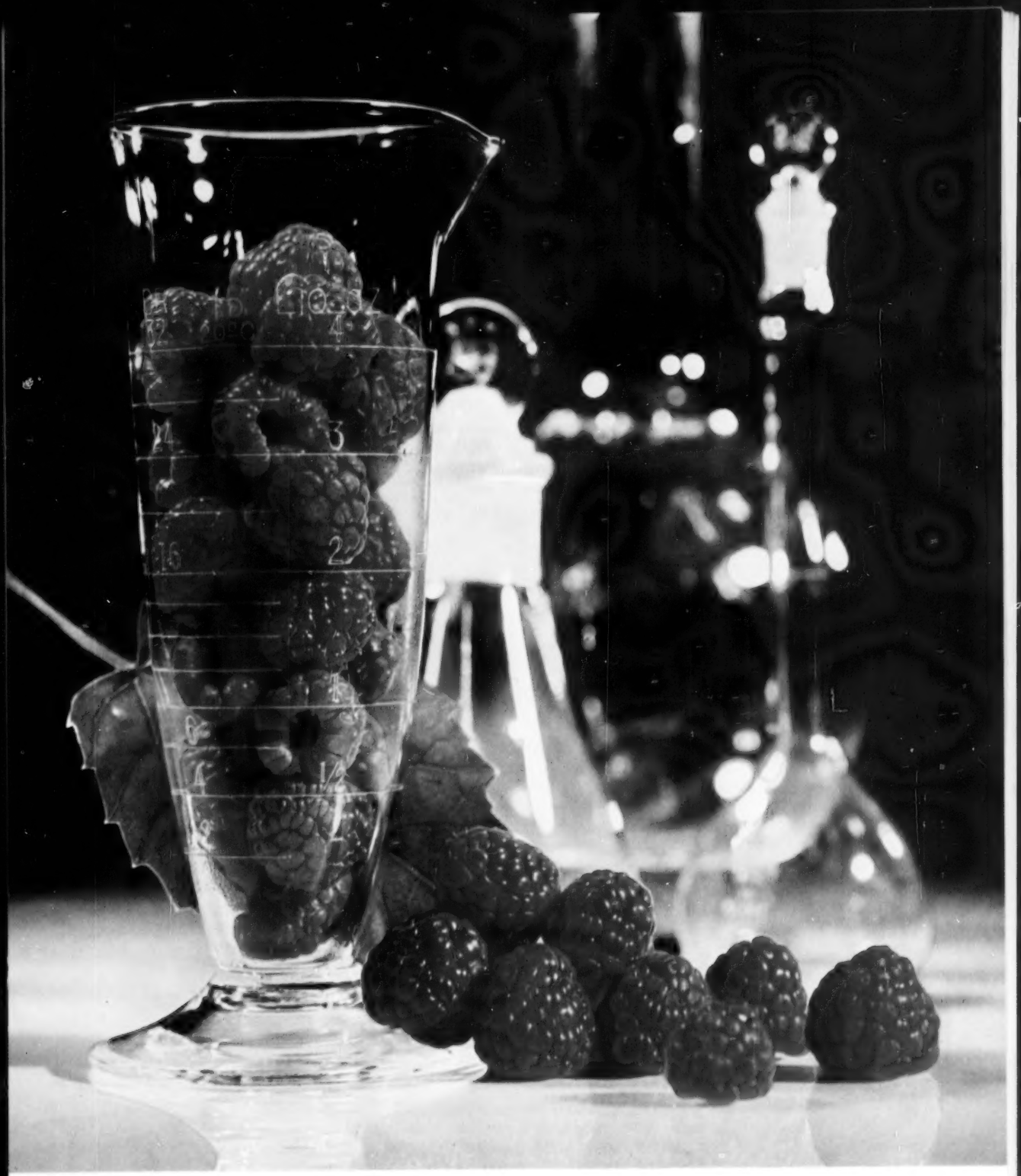
Builders of Better Machines and Equipment Since 1872

W. F. & JOHN BARNES

FOOD & CONTAINER SECTION

407 S. WATER ST. • ROCKFORD, ILLINOIS

RETORT BASKET LOADERS AND UNLOADERS
DOLE ASEPTIC CANNING EQUIPMENT • UNIVERSAL CASE PACKERS



IMITATION RASPBERRY BY FIRMENICH

You get the direct and authentic reproduction of raspberries in their full perfection in Raspberry Flavor by Firmenich. For Firmenich took fully ripe raspberries, freshly severed from the stem, captured their delicate and fugitive flavor, and by original research reconstructed it with all its significant and desirable components. Firmenich Raspberry comes to you as a precise and potent flavor material of the utmost purity and stability to enhance the flavor of your products and to give them greater sales appeal. Samples and technical data on request.

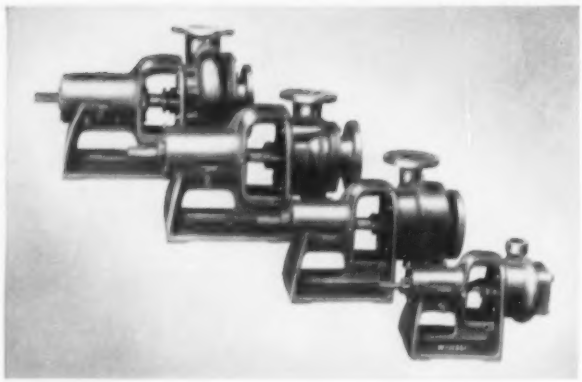
FIRMENICH & CIE
SUCCESSEURS DE
CHUIT NAEF & CIE
GENEVE SUISSE

FIRMENICH INCORPORATED

[illegible]

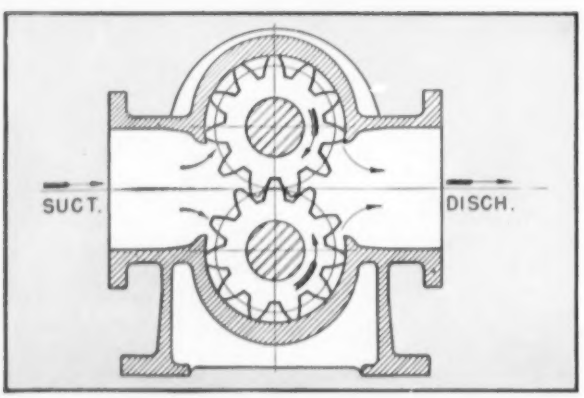
WHAT'S YOUR P.Q.*?

* Pump Quotient



Why are more and more end-suction pumps being specified? The answer's *simplification.* Industry is turning to end-suction pumps because they simplify piping (especially in process applications), need only one stuffing box, and make parts replacement easy. Get the full story on the Worthington end-suction pumps by writing to Section PC.4.8.

What is Worthite? Worthite is Worthington's "super-stainless", corrosion-resisting alloy steel containing more than 50% of the alloying elements: nickel, chromium, molybdenum, silicon, copper and manganese. The balance is mainly iron. Worthite was first introduced in 1936 and has gained wide acceptance as an excellent construction material for applications where corrosion is a problem. Worthington, of course, offers a complete line of Worthite pumps. Write for Bulletin W-350-B4.



Why are gear-type rotary pumps best for handling high-viscosity fluids? Lots of reasons. First, their large, unobstructed passages mean low entrance losses. Then, there aren't any valves or valve springs. Also, there's the flexibility in application offered by the wide speed range of gear-type rotaries. Write for Bulletin W-483-B2 for facts about the Worthington double-herringbone gear rotary pumps and vane pumps. PC.4.8

See your Worthington distributor for more information about end-suction pumps, Worthite and gear-type rotary pumps. But if you want to read up on these products before talking to him, write for our bulletins today. Worthington Corporation, Standard Pump Division, Section PC.4.8, Harrison, New Jersey.

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Jones & Laughlin Steel Containers provide dependable protection for your products. They are built of sturdy, high-quality J&L Steel Sheet. Careful manufacture assures accuracy in all fittings and closures. J&L containers have a trim appearance which can be decorated attractively with colorful designs and illustrations by means of J&L's lithographic process.

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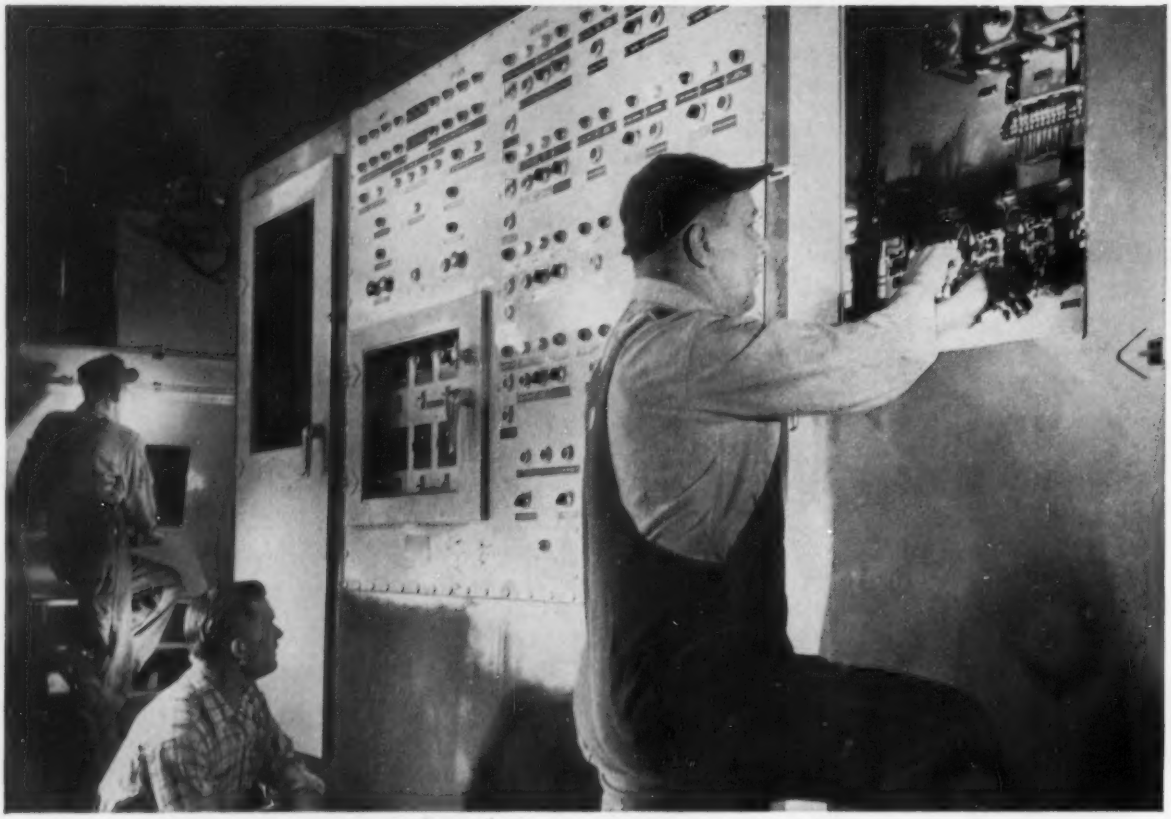

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If there's anything worth its weight in gold in a proportioning system control panel, it's *dependability*. Before a single electrical component was designed into this panel being wired at Richardson Scale Co., its prototype had been literally worked to death in a controlled testing operation. It's survival of the fittest . . . and only the fittest is acceptable. Richardson's reputation as a producer of dependable control panels rests, in the last analysis, on the selection of tested components and on intensive and varied experience in applied electronics.

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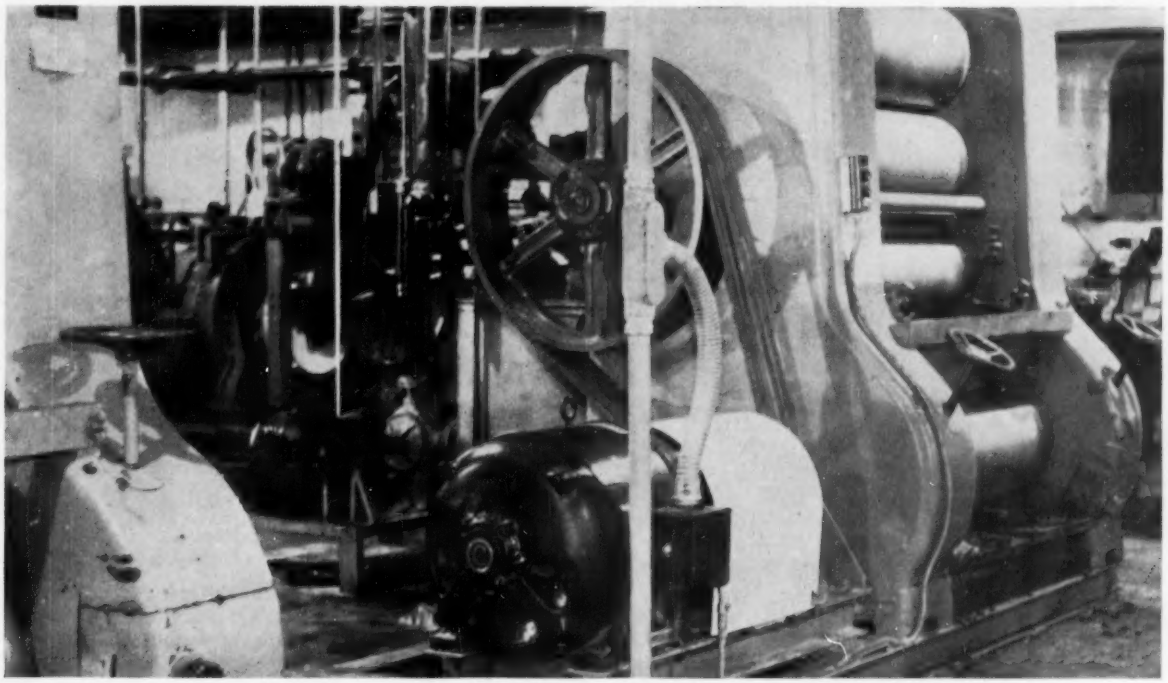

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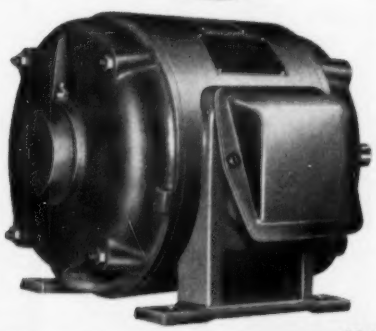

CE-29

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Research and Development Laboratories for Aluminum Foil Packaging

Report No. 1 of a Series by Reynolds Metals Company

Research staff and laboratory equipment are necessarily the means by which packaging progress is achieved. It is felt, therefore, that an overall view of research facilities is a proper subject for the first article in this series. Those following will deal with specific properties of aluminum foil as applied to packaging.

Reynolds Metals Company operates two packaging laboratories—the Research and Development Laboratory at Richmond, Va., and a laboratory specializing in printing problems, in conjunction with Reynolds printing plant at Harrison, N. J.

The primary purpose of Reynolds Research and Development laboratory is to explore all possibilities of future developments in foil packaging and in industrial foil applications. Coincidentally, the Laboratory conducts continuing development and evaluation of all materials used in conjunction with aluminum foil—papers, adhesives, inks, coatings, waxes, hot melts, plastic films, etc.

A function of utmost importance is the technical service rendered on individual packaging problems that arise within the packager's plant. Such service provides for positive technical assistance in all fields, as it allows a trained man to work within the packager's plant, to assist in solving his problems. Such assistance is available through Reynolds regional representatives.

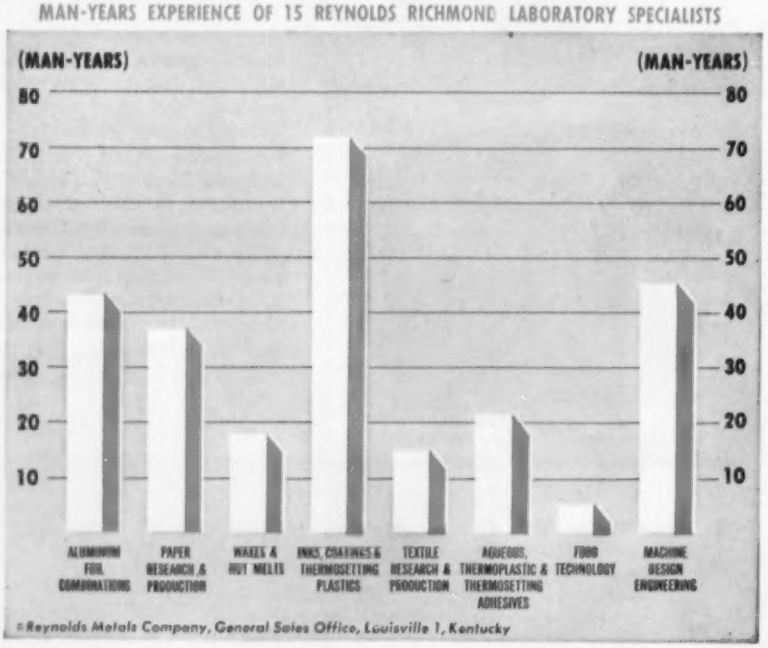
The Laboratory is not only fully equipped for testing of raw materials and new combinations; it can also duplicate practically any plant operation. Equipment includes, in addition to pilot machines:

Walk-in cabinets that can be maintained under various temperature and humidity conditions • Simplex bag-making machine • Sentinel, Seal-Craft and Doughboy heat-sealing machines • Completely equipped Home Economics Kitchen • Spectrophotometer • Photographic Rooms • Deep-Freeze Room • Vibration Machines • Atlas Fadeometer • Atmosphere Control Company moisture vapor transmission cabinets • Complete equipment for paper and foil testing.

The Research Staff at Reynolds Richmond Laboratory, consisting of 30 Technicians, represents extensive experience in all fields concerned with packaging—as summarized by the chart shown. Of the 15 key men, 10 are chemists, 3 are chemical engineers, 1 a machine engineer and 1 a food technologist. Each is a specialist in his own field. One holds a Doctor's degree and three hold Master's degrees. One of the Master's degrees is in Food Technology.

This Laboratory and its Staff have been responsible for many important developments in aluminum foil packaging. Among these are: caustic soluble beer labels, soap packages, margarine and butter packages, fiber canister labels and liners, many different heat-sealing foil laminations and semi-rigid containers. Problems currently in the course of solution for packaging customers promise further important developments.

MAN-YEARS EXPERIENCE OF 15 REYNOLDS RICHMOND LABORATORY SPECIALISTS



Reynolds Metals Company, General Sales Office, Louisville 1, Kentucky

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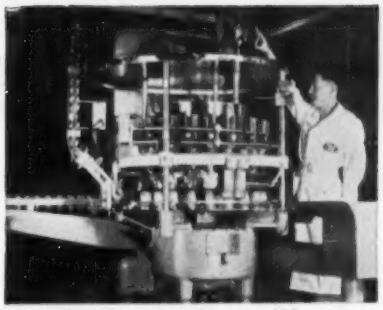
by time . . .
by varied applications



Minute Maid Corporation fills up to 600 containers per minute with Pfaudler 21-station Fillers. 1/10 of an oz. accuracy keeps costs low.

How these big producers profit with Pfaudler Piston Fillers

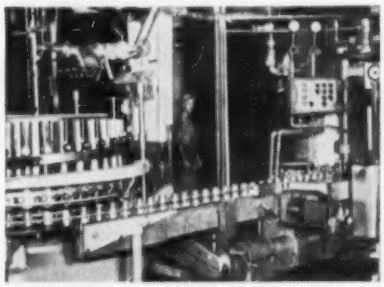
These companies are successfully processing everything from semi-frozen juices to potted meats. They fill tin, glass or composition containers in a variety of shapes and sizes. All use Pfaudler Rotary Piston Fillers. All get fast, accurate filling.

For example, H. J. Heinz gets a breathless 800 cans per minute (has run 1050!) filling baby food with a Model RP-35. Production rates are correspondingly high with 7-, 14- or 21-station Pfaudler Fillers. Even gallon containers can be filled at 100 per minute, using the 7-station RP-7.

Mechanical efficiency is a profit factor, too. Pfaudler Fillers are accurate to within ±1/10 oz. No-can-no-fill device prevents waste, keeps machine and containers clean. Model RP-35, equipped with an electric brake, stops rotation within 2/10 of a second.

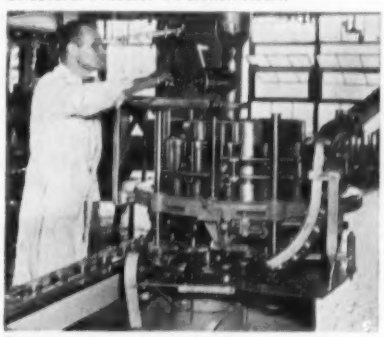
Because spillage is avoided, cleaning is less of a chore. Valves and pistons slide out easily for fast cleaning and visual inspection. One man can do the whole job in 30 minutes. He needs no tools either.

The speed and efficiency of Pfaudler Rotary Piston Fillers have been proved and tested in nearly 10 years of operation by leading names in the food industry. You, too, may profit from the speed, low maintenance and low operating cost of Pfaudler Fillers. Complete data on models and speeds is in Bulletin 911. Send for it today.



H. J. Heinz Co., at Leamington, Ontario, Canada, fills more than 800 cans of baby food per minute with 35-station Pfaudler Filler, world's fastest.

Hershey Chocolate Corp., Hershey, Pa., fills 300 five-oz. cans of chocolate syrup per minute on each of several Pfaudler 14-station Fillers.



Kingan & Co., Indianapolis, Ind., uses 14-station filler for potted meats. Machine is rated at 150 to 400 cans per minute.

THE PFAUDLER CO., Dept. FE-2, Rochester 3, N. Y.

Please send me, without obligation, your fact-filled booklet "Rotary Piston Fillers," Bulletin 911.

Name_____ Address_____

Title_____ City_____

Company_____ Zone____ State_____

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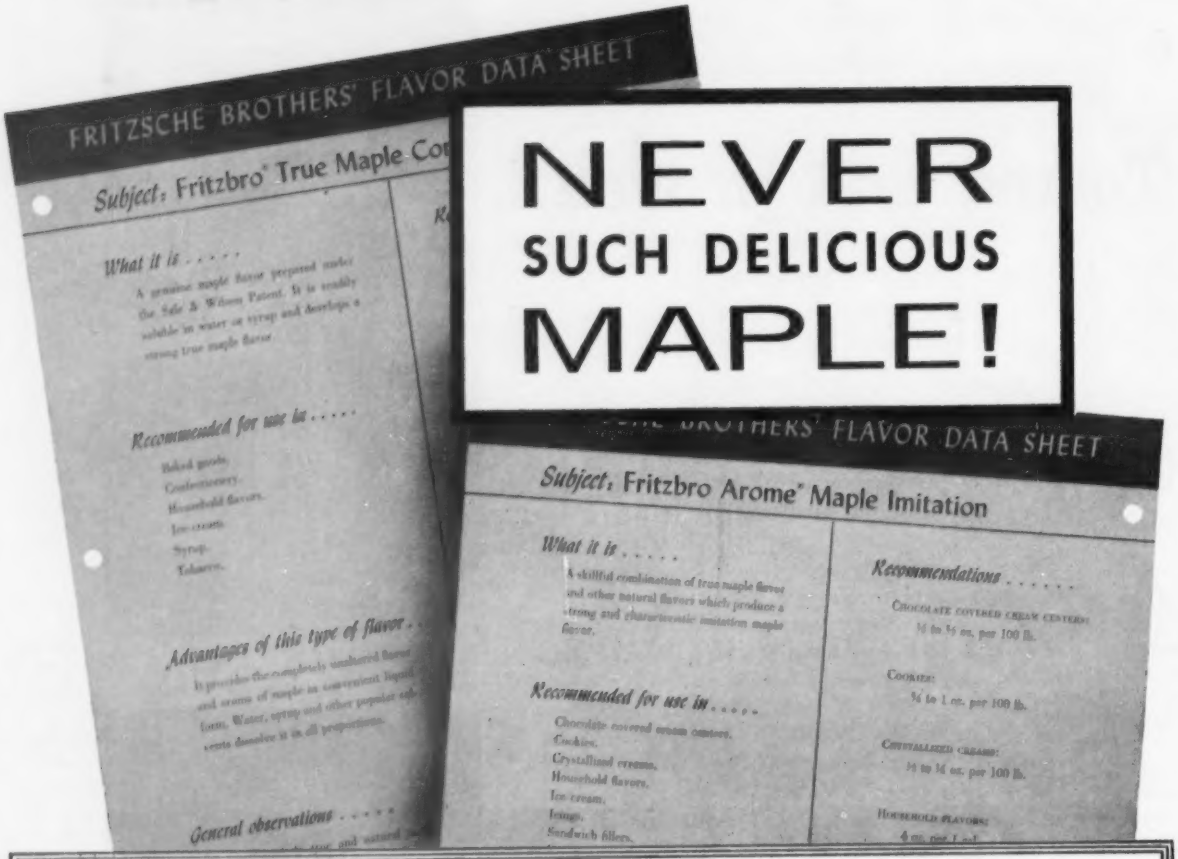
FRITZSCHE BROTHERS' FLAVOR DATA SHEET
Subject: Fritzbro® True Maple Co
What it is . . . . .
Recommended for use in . . . . .
Advantages of this type of flavor . . .
General observations . . . . .
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MAPLE!
FLAVOR DATA SHEET
Subject: Fritzbro Arome® Maple Imitation
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A skillful combination of true maple flavor and other natural flavors which produce a strong and characteristic imitation maple flavor.
Recommended for use in . . . . .
Chocolate covered cream centers.
Cookies.
Crystallized creams.
Household flavors.
Ice cream.
Icings.
Sandwich fillers.
Recommendations . . . . . .
CHOCOLATE COVERED CREAM CENTERS:
½ to ⅝ oz. per 100 lb.
COOKIES:
¾ to 1 oz. per 100 lb.
CRYSTALLIZED CREAMS:
½ to ¾ oz. per 100 lb.
HOUSEHOLD FLAVORS:
4 oz. per 1 gal.

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Mixes hot and cold water to desired temperatures. Unaffected by variations in water pressure. Provides an accurate controlled source of tempered water for industrial, chemical and food process requirements, as well as wash basins, gang showers and similar installations.

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the cellular, stay-dry insulation

STAYS DRY—Cut a piece from your sample. Place it in water. Note how the hermetically-sealed glass cells filled with dead air keep it afloat. Weight it down for days, weeks or longer if you like. Remove the weight and it bobs back to the surface . . . proof that the sealed cells have absorbed no water, still have their original insulating efficiency.

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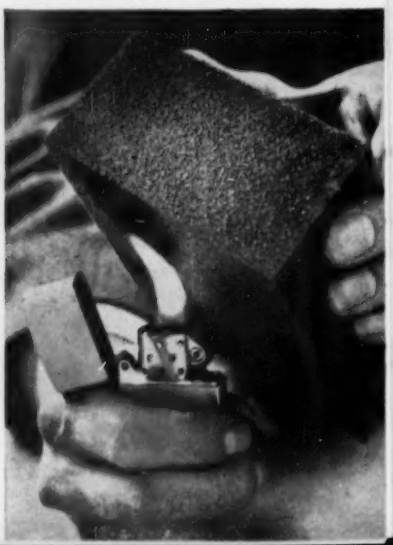

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Department O-26, One Gateway Center
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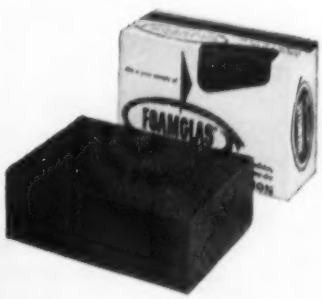

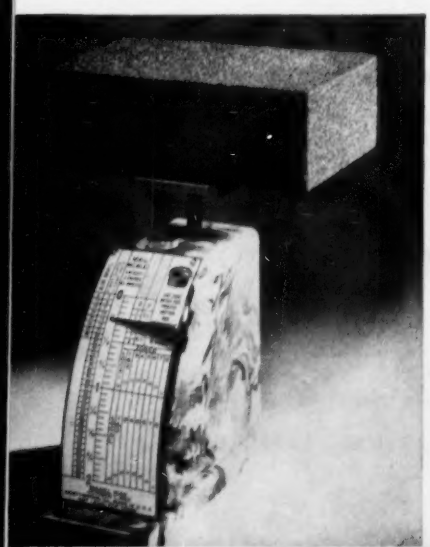

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Please send me a sample of FOAMGLAS for testing.

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Company _____ Title _____

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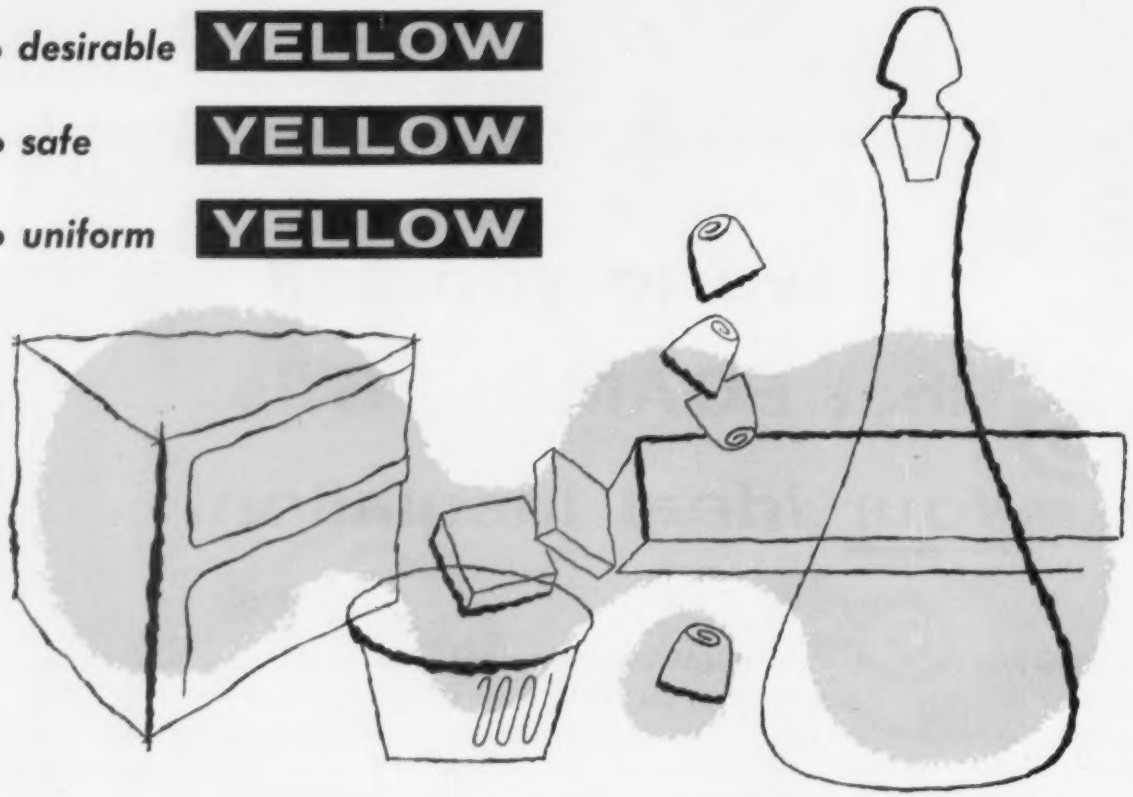
• *desirable* **YELLOW**

• *safe* **YELLOW**

• *uniform* **YELLOW**



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Detailed Information For You. The Roche brochure about the application of Beta Carotene 'Roche' is available without charge. Send today for your personal copy. Samples and technical service are available on request. Ask your Roche salesman or write the Vitamin Division.

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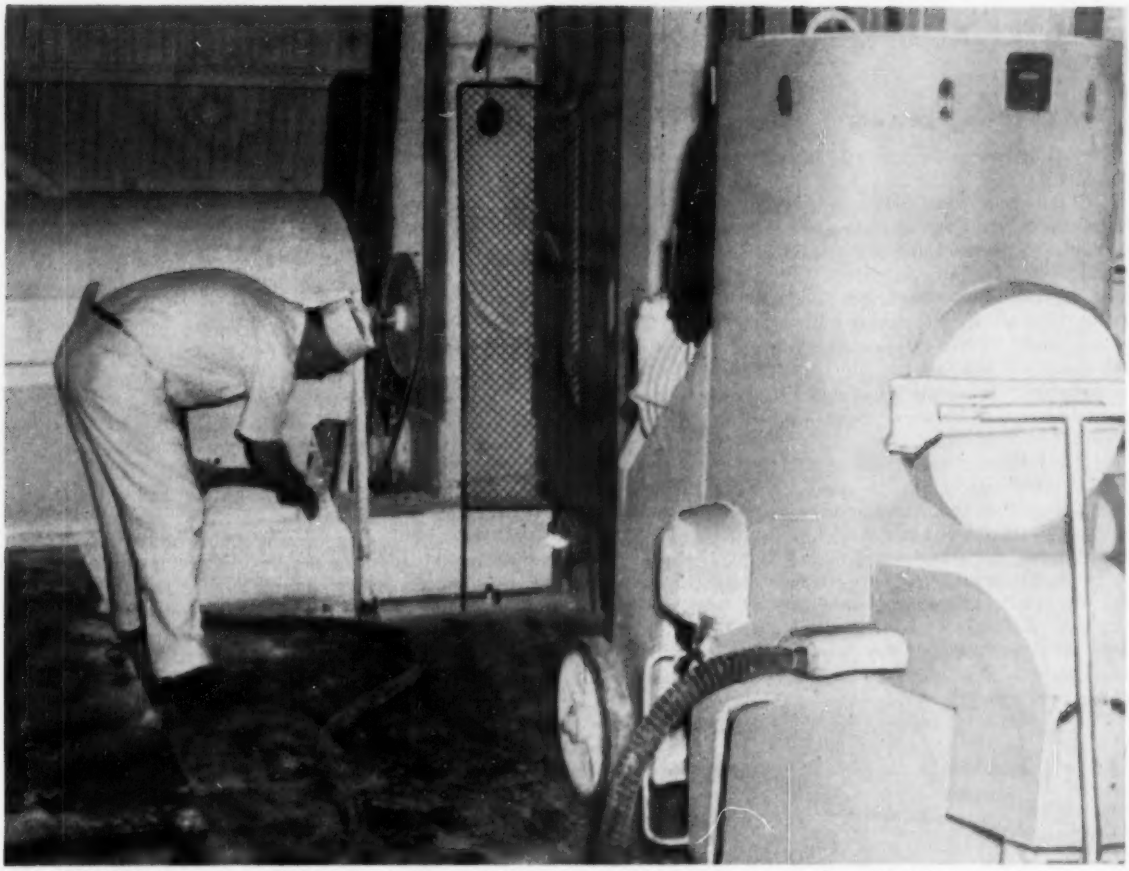


IT'S ESSENTIAL to remove infestable food materials to interrupt life cycle of insects. This bakery sanitarian employs a portable vacuum cleaner to pick up flour that has accumulated in equipment.

4-Way Insect Control

This proved approach curbs (1) crawling, (2) ingredient-attacking, (3) structure-infesting, and (4) flying pests. And it gives pointed accent to the basics—proper sanitation, good housekeeping, harborage elimination, practical programming, and checks of materials

E. L. HOLMES and T. L. HUGE
American Sanitation Institute, St. Louis, Mo.

For two major reasons, insect control is vital to the food-plant sanitation program.

1. Federal, state, and city agencies—backed by consumer demand for wholesomeness in foods—take sharp regulatory action aimed to curb insect contaminations. And these agencies are now supported by a large number of court decisions which take the position that foods and beverages adulterated with debris from insect infestation are serious violations of pure food laws.

2. Serious economic losses result when the public learns of consumer complaints pertaining to foods containing debris from insect infestation.

It is, therefore, generally accepted that food companies must exercise emphatic measures to assure that their plants are free from living, breeding, insect infestations and properly protected to bar the entrance of insect invaders.

Occasionally the claim is still made that insects may not be harmful in themselves.

While this claim is correct in some instances, it is nevertheless true that flies and crawling insects, primarily breed and live in filth and do carry dangerous organisms into foods. Accordingly, insect particles in a food plant are publicly considered an index of poor plant sanitation.

Plants need to control four major types of infestation—brought about by (1) crawling, (2) ingredient-infesting,

(3) structure-infesting, and (4) flying insects.

1. Vs. Crawling Insects

Control of crawlers centers in two basic attacks:

1. Eliminating areas where these insects can seek shelter when brought into a plant in cases, trays, cartons, or bottles. This is commonly done by filling all shelter-providing cracks and crevices with a soft, slow-drying caulking compound. Plant interiors should have sealed, smooth surfaces.

2. Carrying out program designed to kill any roaches crawling about the plant and seeking harborage.

Prior to World War II, about the only available insecticides to combat roaches were contact pyrethrin sprays, pyrethrin or rotenone dusts, or poisonous inorganic powders spotted about the plant. Principal inorganic powder used was the dangerous sodium fluoride, and civil cases resulted when it got into products and was blamed for illnesses. Its use was legally banned in some localities, and in others it had to be colored a warning blue.

Also occasionally used was pyrethrin powder mixed with borax, concentrated pyrethrum oil, or water-emulsion sprays.

Generally, these insecticidal methods were not too efficient, so that plants continued to suffer infestations.

After World War II, however, there came the concept of *preventive sanitation* and use of the *residual spray* in food plants. Initially, a 5% solution of DDT in an odorless, colorless, non-corrosive oil base was advocated for spraying surfaces where roaches might crawl. The oil evaporated, leaving the DDT in an effective concentration of 200 mg. per sq. ft.

It is not necessary, as erroneously first thought, to use a residual spray in the same manner as the former contact sprays—pouring the liquid into likely roach-harboring areas. Instead, there is spray-treating of the surfaces where the insects might crawl in seeking harborage, and penetration of the insecticidal mist into the hidden places is pertinent.

Important here is the aforesaid new technique of using residual deposits as a preventive measure.

Nation-wide excessive use of DDT resulted in the contamination of foods with appreciable amounts of this insecticide. An exhaustive tests established that more than 5 ppm. represented a chronic poisoning hazard. As a result, its employment in dairy barns was banned, and its use in food plants generally has been emphatically discouraged by the FDA.

Meanwhile, chlordane, a new chemical, proved much more effective against roaches when used in identical manner as the original DDT residual. It was found by Food & Drug authorities to be four times or more chronically toxic than DDT, and its use has been even more emphatically discouraged by the FDA.

Safer Bug Killer

There is constant effort by sanitarians and insecticide manufacturers to develop new residual insecticides, relatively innocuous to humans, that can be used in the manner described above. At present, a combination of 3% methoxychlor and 5% lindane is recommended.

The FDA advises that, if used with care, this product is probably as safe as any presently offered. Methoxychlor is considered to have no chronic toxic effect. And although lindane is considered to be about ¼ as toxic as DDT chronically, it is used in only $\frac{1}{10}$th the quantity of DDT in the above-mentioned spray mixture (only 1/40th the potential hazard of DDT and 1/60th that of chlordane).

So at the present time, this combination of methoxychlor and lindane is widely used and is commonly recognized as safe for control of roaches.

However, in employing a residual application, it should not only leave a residue but also be an effective contact spray. A combination, therefore, of 3% methoxychlor and 5% lindane with pyrethrum contact-type sprays that immediately kill, is often recommended as a double acting insecticide.

At the least, if pyrethrins are used, they act as an irritant to stir the roaches in their harborages so that they will more readily travel across areas treated with the methoxychlor-lindane mixture.

Other insecticides are recommended, but they are not sanctioned as being safe in food plants because of their direct toxicity or inherent danger to the operator. Such products are parathion, dieldrin, aldrin, and a number of others.

Incidentally, there is now some indication that products such as strobane and diazenone may, after further study, be released for food-plant use.

2. Vs. Ingredient Insects

Control of ingredient-infesting insects is difficult. They generally ride into a plant with ingredients which are erroneously considered to be free from infestation.

TIPS BEFORE YOU SPRAY

FOOD PLANT OPERATORS should make sure their insecticides are properly labeled and carry directions for use that are approved by the U. S. Department of Agriculture.

It should not be implied, however, that such labeling means the insecticide can be used safely in a food plant by any average inexperienced person.

All insecticides are considered adulterants when present in foods. None of the recommended residual products can be safely sprayed on foods or food-contacting surfaces. They should only be applied by trained operators—men who know their suitability for use in the specific areas and who know their inherent dangers.

Processors should be cautious where use of insecticides may risk later criticism or worse eventualities. For example, data in years to come may prove some newer insecticide to be toxic, bringing widespread adverse publicity—even specific claims or litigation—relative to earlier practice with it.

There are no specific approvals by the Food & Drug Administration of the use of insecticidal products in food plants. FDA merely comments upon what it considers to be relatively safe.

A number of plants continue to use DDT and chlordane, indicating there is a safeguard in that only experienced employees apply them. This use of the frowned-upon insecticides is not necessarily a defiance. It can be considered an assertion of their legal rights of responsibility.

However, it is the authors' opinion that unless such plants have very elaborately controlled programs, they are playing with unnecessary hazards. Relative costs of the different insecticides and outlays for their use are insignificant when all hazards are considered.

¶ Because of their dangerously low flash points, some insecticides, particularly when fogged or space-sprayed, present definite risk of fire and explosion. To guard against using such products, processors should specify products having Underwriters Laboratories seals and flash points in excess of 160 F.—*E.L.H. & T.L.H.*

Take, for example, flour or dry milk. These products are sifted before packaging, thus removing any insect adults or large larvae. However, small larvae and eggs pass through most sieves larger than No. 10 cloth. If the ingredients are plant-stored too long, such eggs will hatch or small larvae develop into adults.

Therefore, it would behoove a processor to limit use of infestable ingredients and inspect each incoming shipment. For example, when a carload of flour is received, a number of bags equal to the square root of the number in the carload should be sifted through a 30-mesh screen or mechanical sifter. Adult insects and recognizable larvae should then be counted. And, if they average more than 2 per bag, shipment should be rejected. In fact, if they average over 1 per bag, refusal of shipment should be seriously considered.

In any event, the finding of insects under such circumstances—except, perhaps, a stray one that might not be attributable to the shipment—should be discussed with the supplier. And he should be warned that all future shipments will be checked and questionable ones rejected.

Basic problem with stored-food insects lies in infestable residues that may be left about a plant. In the past, bakeries had much equipment that collected static or residue flour. For example, bottoms and heads of bucket elevators, ends of conveyors, and the like. Here, infestation could develop. The situation was similar with dried milk, with semolina in macaroni plants, or with any powdered ingredient inherently liable to insect infestation.

The life cycles of insects to be eliminated are of vital importance here, for static flour and flour residues must be removed by frequent cleaning in order to interrupt these cycles. Recommended is the use of industrial-type vacuum cleaners.

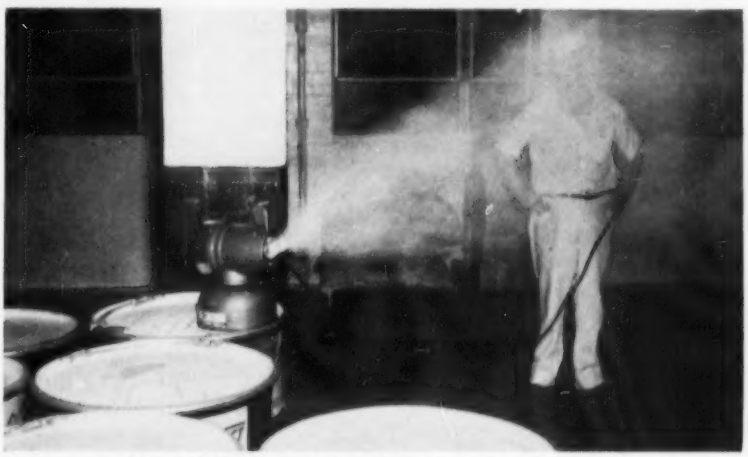
All too often, plants try to accomplish such cleaning by using an air hose, with subsequent sweeping of residues blown out of equipment. This practice is never thoroughly effective and serves primarily to redistribute infestations along with the flour to other areas where it often is difficult to sweep them clean. It is much better to pick up the residues with a vacuum cleaner.

When an air hose must be used, its nozzle should be soldered closed and a hole made with a No. 50 drill. This small orifice provides air current which will have pressure behind it but not much volume of flow. Therefore, the hose will blow dust directly ahead instead of scattering it.

Applying residual sprays . . .

AS A PREVENTIVE MEASURE versus crawling insects, residual-spray technique is used. Insecticide is applied on surfaces where roaches might crawl. When oil evaporates, effective insect-killing deposit remains.

. . . and space sprays



HERE, FLYING INSECTS are kept under control by employing space spray that "fogs" finely atomized insecticides over large plant area. No. 1, however, is keeping most insects out of plant in the beginning.

This will, of course, somewhat slow up the immediate cleaning. But it will probably speed the overall sanitizing job, for it doesn't entail so much loose material to be later vacuumed or swept up.

Vacuum Systems

Our experience has shown that a 1½-hp. vacuum cleaner rapidly removes flour dust from equipment. It is more mobile than a larger machine, and it is our recommendation that the 1½-hp. motor be used with as small a vacuum cleaner as really necessary.

For removal of a large quantity of flour, such a vacuum machine can be obtained with a 55-gal. holding container. For normal uses, a 20- or 14-gal. container may be satisfactory and easier to handle. A vacuum cleaner should have suitable extension tubes to reach the various areas needing cleaning.

For overhead work, portable vacuum units can be used efficiently and easily. Further, there is the wet vacuum cleaner—one that picks up solutions as well as dry dust. If such a unit is purchased, it must contain an electronic shut-off to prevent motor damage.

About 80 to 85% of the problem in curbing stored-food insects involves adequate cleaning at frequencies interrupting their life cycles.

ADDED MEASURE is use of spot-fumigation technique where infestable material is difficult to remove, as in this closed flour-handling equipment. We see spot fumigant (liquid form) being slowly applied at top of sealed unit so that it vaporizes while dropping to bottom of equipment.

With the confused flour beetle this means ridding infestable residues about every three weeks. It is recommended that large plants be divided up on a basis of areas—say three, so that each area is regularly cleaned in a staggered 3-week-interval routine.

Spot Fumigation

As an added measure, spot fumigation of closed equipment is often recommended to follow cleaning, since it is virtually impossible to remove all infestable material like flour from closed equipment. Therefore, spot fumigation with a heavier-than-air gas-fumigant mixture is often employed for killing a likely-remaining stray insect before it starts breeding.

Commonly employed spot fumigant is basically 70 to 75% ethylene dichloride and 20 to 25% carbon tetrachloride. This mixture, however, is quite toxic and must be used with care.

After equipment has been cleaned, it should be tightly closed and the spot fumigant applied in liquid form. It is best fed slowly from the top so that it vaporizes while dripping to the bottom of equipment.

Recommended, for example, is spraying of the liquid in fine droplets, so that vapor is immediately formed. This is effective provided excessive air is not introduced to increase pressure in the equipment and, thereby, lose a good deal of fumigant. This latter can present an industrial hazard to the person applying the material and others working in the vicinity.

Use of a "slow drip" method has been found very effective and least hazardous. A metal drip cup, fitted with a drop device for regulating rate of flow, can be permanently attached on top of equipment. A pint or quart of spot fumigant can drip inside the empty equipment, slowly evaporating and building up a layer of gas that starts at the bottom and gradually rises to the top. No more liquid need be placed in the cup than is needed for complete treatment of the interior.

About 80% saturation of the interior with fumigant gas is necessary to kill "confused" flour beetles in 4-hr. (the period it takes the fumigant to penetrate about ½ in. of flour residue).

Procedure is to use 34 fl. oz. of liquid spot fumigant for each 100 cu. ft. to be fumigated and to apply it at a rate whereby it takes 15-20 min. to drip-evaporate into the equipment. Then the equipment is sealed for 4 hr. Note: There should not be over ½ in. of flour residue in the machine.

Use of residual insecticides, as against crawling product-infesting insects, is also effective.

3. Vs. Structure Insects

Controlling structure-infesting insects, such as the sawtooth beetle and the dermestid, requires the same general procedures as for other crawling insects.

Additional problems are presented, however; for these insects often do not leave the structures they are infesting. Most of them, particularly the dermestids, have a life cycle resulting in many cast larvae skins, which are blown about. And it is the presence of these skins that presents the greatest hazards sanitation-wise to plants.

Assailing insects such as sawtooth beetles, which infest cracks and crevices in the bases of floorwall junctures, requires periodic application of a residual spray (such as for cockroaches) to assure good control after flour and dust residues have been removed.

The cabinet beetles commonly infest dry milk plants, presenting a serious problem. Early in their cycle, these insects keep to the dark. But in the adult stage they go to light areas and subsequently die. Ordinarily, then, these beetles are only spotted at the end of their cycles—appearing as black objects that look almost like cinders and probably lying on window ledges.

Finding of one or two of these dead beetles on a window ledge impels a thorough search of the plant, likely disclosing a very large active infestation in some obscure spot where milk powder has accumulated. Such a spot can even be a floor area underneath the packing region where spilled powder has been swept down into the floor cracks.

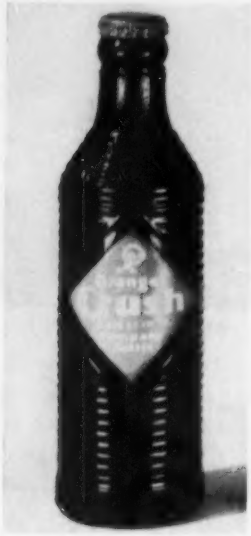
To control such inaccessible areas effectively is a poser. There is not much that can be done short of opening up the flooring and eliminating it directly.

However, one floor technique is to use a sweeping compound, basically consisting of mica dust, pyrethrins, and piperonyl butoxide as a synergist —a combination known as pyrenone protectant.

This material probably acts mostly

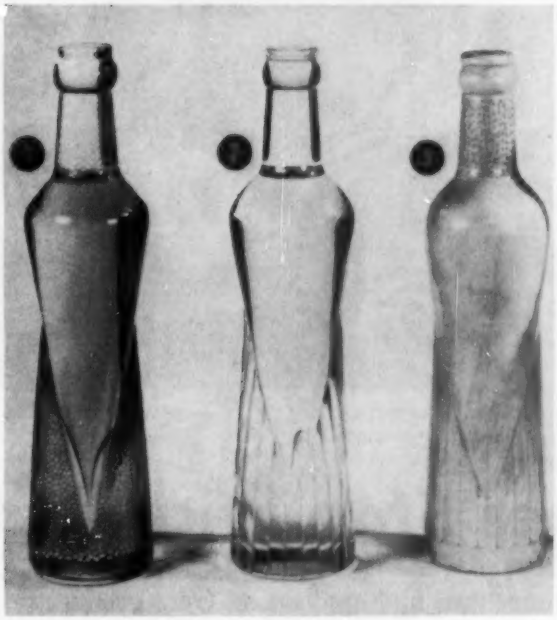
(*Turn to page* 197)

From this . . .



FORMER bottle was squat and unattractive, lacked all-important visual sales appeal.

. . . by way of these . . .



MODELS of Lucite and wood helped iron out production kinks in design. Bubbly effect on Model 1 was replaced by fluting on Model 2 for better inspection. Rounded base and stippling on neck marked Model 3.

. . . to ideal design

ACCEPTED bottle meets all processor's requirements of function, economy, appearance.

Sales-Boosting Bottle Tailored to Plant Needs

The new 10-oz. container had to be slim and graceful, yet adaptable to standard bottling equipment. Solution was careful blending of design with practicality

A CAREFULLY planned switch to a bright new bottle design has spelled out a 200% sales boost for Orange Crush Bottling Co. and avoided production-line troubles.

When the carbonated orange pop processor decided to adopt a more attractive container specific goals in economy, function and appearance were established. And careful study indicated that, a slimly tapered bottle with applied color label was the answer.

Working with full understanding of bottling problems, Jim Nash Industrial Designers (in cooperation with Owens Illinois Glass Co.) came up with a lucite model boasting streamlining and practical grip control.

Production "Bugs" Removed

But this had a production-line depot —a "bubbly" design on the body. This had to be replaced with fluting to permit better inspection—particularly important since bottles are refillable. At the same time, this fluting also helped emphasize container's height and slimness.

Then for efficient handling on standard bottling equipment, three further revisions were necessary:

1. Easier access of cleaning brushes was assured by smoothing all interior shoulder angles.
2. Uniformity of the glass thickness was tested for breakage in handling and adjusting accordingly.
3. Height of the neck was adjusted for better adaptability to filling equipment and to maintain an acceptable fill height.

After a second lucite model incorporating the fluting was approved, a third was made of wood. Here a stippling effect was added to the bottle neck and the base was rounded.

Crash and filling tests were conducted and a final analysis made before test marketing. Tests in Canada and the U. S. soon showed the value of the new design as sales tripled.

Though the design was specially engineered for the 10-oz. bottle, it lends itself practicably to the 8-oz. size. The applied label provides fast and distinctive product identification.

According to Louis Collins, vice-president and general manager of Orange Crush Bottling Co., the sales increase is due to the "immediate appeal of the new bottle to the consumer and to the trade."

CHAR-FREE BAKING is accomplished by spraying pans with a thin film of silicone. Coating replaces old-style greasing and oiling, and keeps pans shiny for long periods. Sparks sanitation, too, by eliminating smoke-stained rooms and equipment.

Silicones *Stop* Stick and Foam

Versatile compounds find application from product preparation to packaging. They act to protect quality, ease sanitation, and end waste

DR. ROB ROY McGREGOR

Research Administrative Assistant, Dow Corning Corp., Midland, Mich.

Over-flowing kettles . . . Spillage around tanks and fillers . . . Gummy packaging machines . . . Burned coils and bake pans . . . All have two things in common. They waste both materials and costly labor.

Thus any compound which can beat these problems—yet still be safe for use in foods—merits considerable attention.

Just such an answer is found in silicones—odorless, tasteless, and non-toxic products that end foaming and sticking troubles, and are themselves used in only minute quantities.

Compounds for prevention of product foaming are available in two forms: (1), a honey-like product containing 100% solids (Dow Corning Antifoam A); and (2), an aqueous emulsion containing 30% solids (Dow Corning Antifoam AF Emulsion). The latter is most commonly used in food processing.

Silicones are not volatile even at high temperatures and reduced pressures, thus they remain with the product throughout process.

Ways to Stop Foaming

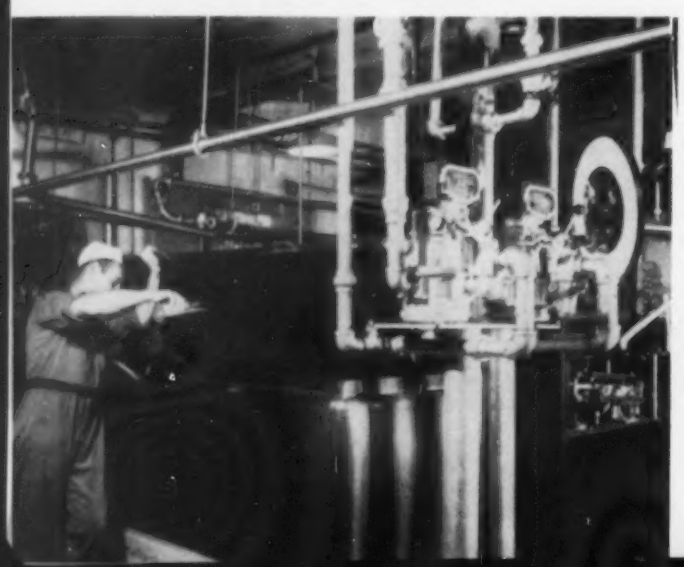
They are effective in extremely small amounts—generally a few ppm. will turn the trick. And these minute quantities can be added to the product in two ways:

(A) A small batch of the food to be processed is prepared. The 100% silicone is added to make a convenient percentage, say 1%. This food-silicone mixture can then be added to the full charge or cook to give any desired concentration.

(B) If emulsion-type compound is used, it is merely diluted with water to a practical concentration. In such form, it can be added accurately and economically to the product.

Foods and processes in which these defoaming agents can help are about as numerous as products that foam. Examples include: Preparation of jellies and jams, concentration of sugar syrups and tomato sauce, fermentation of cattle feeds, protein concentration, and yeast manufacture.

In fact, wherever foam control is needed, at least a trial of a silicone defoamer is suggested.



PRODUCT FOAMING is drastically reduced in fudgsicle mix (which froths during pumping) by merely adding 3 oz. of a silicone anti-foam solution to each 600-gal. batch.

It is not always necessary to add silicones directly to the product. In small tanks, a thin ring, painted or smeared, at the right height around the inside of the kettle may suffice. Foam breaks when it touches ring.

Foaming also occurs in bottling soft drinks, molasses, and other liquid products. Here, a thin coat of silicone rubbed on the filling nozzles often end the problem.

How to Stop Sticking

In addition to their anti-foam qualities, silicones have the remarkable property of refusing to adhere to a wide variety of materials.

This non-sticking feature has been put to good use in the food industry. Here, application of a silicone is generally as simple as it is effective.

In liquid cooking kettles—such as are used for ketchup, tomatoes, and similar products—the heating element must necessarily be at a greater temperature than the kettle contents. If this temperature difference is high, "burn-on" can result. Such a condition results in poor heat transfer, presence of over-cooked or desiccated particles in the product, and the necessity of scraping burned particles from kettle and coils before another run can be made.

In many cases, these troubles can be avoided by simply coating kettle and coils with a thin film of a special, "grease-like" silicone (Dow Corning Slipicone).

Needed amount is very small, and it prevents product from adhering to coil surface. At end of cook, kettle can be cleaned out by merely hosing.

This same compound is also used to prevent sticking in pans, trays and similar equipment. When mixing dough on mechanical rolls, flour dusting is used to keep dough from sticking to the rolls. However, a thin coat of silicone on the rolls banishes sticking—as well as the expense and untidy appearance of excess flour.

Plastic containers sometimes adhere to the sealing bar during heat-sealing. And plastic material can even build up on machine parts. Again, silicone eliminates tendency to stick. The same is true on surfaces subject to deposits of glue or sodium silicate adhesives.

Clean, easy release of baked goods from pans has usually been accomplished by greasing pans with lard or oil. This creates a problem, because scrupulous cleaning after every bake is virtually impossible. Thus, grease accumulates and goes through a number of bakings before being removed. This leads to rancidity and a haze of smoke, which settles on walls and equipment.

Both of these difficulties can be overcome by application of a silicon-resin (Dow Corning Pan Glaze). This product is sprayed or painted on inside of pans and cured by heating. Bread, buns, rolls, and other low-sugar bakery products release easily and cleanly from these coated pans.

Silicone will neither smoke nor become rancid, and one treatment remains effective for 75 to 300 bakes. In truth, use of this resin has become so wide-spread that pan cleaning and glazing services have been established in many parts of the country.

But use of this resin product is not restricted to the baking industry. Meat processors, too, have found it valuable in treating meat loaf pans and smoking racks.

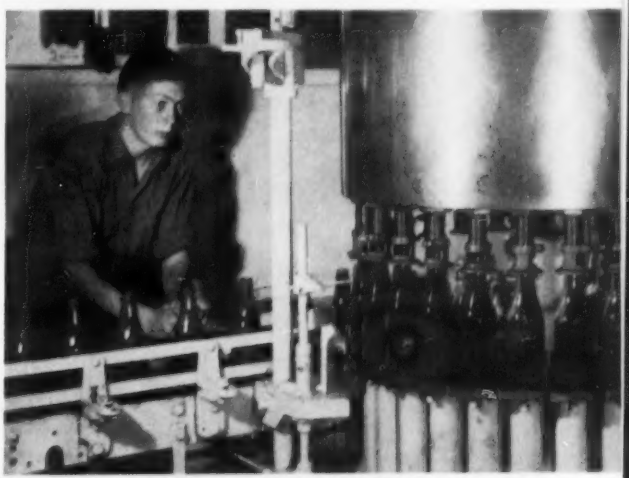
Finally, a very unusual application is silicone treatment of paper. Originally used only on kraft, there are now a wide variety of silicone-treated papers, paper-boards, parchments, and even glassines.

These special products have proved very effective aids in baking and packaging sweet goods. Ovenproof and non-sticking, they eliminate pan greasing and washing, and expensive cartons.

In the bakery, treated sheets are simply placed in dry, un-greased pans. Sweet goods are placed on the paper and baked. Then, liner and product are removed—leaving pans ready for immediate re-use. Sweet goods remain on this paper throughout decorating and packaging, and it provides a cheap, non-absorbent inner liner for inexpensive paper-board containers.

They're Safe, Too

Silicones have been subjected to exhaustive toxicological tests, comprising long-time feeding experiments with



BOTTLING OPERATIONS get double protection from silicones. Coated filler nozzles stop foaming in product, thus prevent slack-fills. Thin application on bottle chains, carriers, and tank reduces adhesion of spillage and speeds cleanup.

IN MEAT PACKING PLANTS silicone protection prevents corrosion on aluminum smoke sticks. One coat lasts from six to eight months. Eases cleaning, too.

IN WINERIES, addition of only 0.2 ppm. of odorless, tasteless, non-toxic silicone controls fermentation foam.

rats[1] and dogs[2]. In no case did these tests reveal any adverse effects.

As a result, Food and Drug permits use of silicone antifoamants in quantities not exceeding 10 ppm.[3]

Thus, processors may use the compounds freely, within the tolerance, in products not covered by Standards of Identity. In standardized foods, presence of defoamer must be declared on the label, and product named in conformance with the FDA Standard.

The anti-sticking silicone, when used in foods other than meat products, must be approved by FDA. The Administration will consider specific uses on receipt of information concerning amount of silicone picked up by a product in a food processing operation. Generally an analysis of food prepared in the treated equipment is sufficient. Where evidence shows no detectable pick up, FDA does not object to use of this silicone.

With meat products, the Bureau of Animal Industry (BAI) has approved non-sticking silicone, provided coating has been baked at 500 F. for 20 min.

There are no restrictions on use of the silicone-resin in food products. BAI has stated orally that it will not object to use of this coating in meat products, and FDA has declined jurisdiction in the matter.

Likewise, there is no governmental objection to silicon-treated papers, either for packaging meats or for processing and packaging other types of food.[4]

Use of silicones on the inside and outside of glass containers to ease emptying of products and increase strength of the containers is a new application. It has not been exploited at this time, and FDA has stated that it will study each such development for individual approval.

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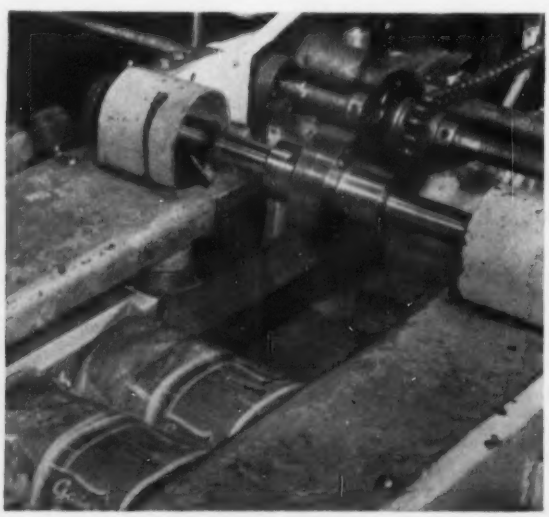
3. A. J. Lehmann, *Some Toxicological Reasons Why Certain Chemicals May or May Not Be Permitted as Food Additions*, Bulletin, Assn. of Food & Drug Officials of the U. S., 14, 82, 1950.

4. A. J. Lehmann, *Chemicals in Foods: A Report to the Assn. of Food & Drug Officials on Current Developments*, Bulletin, Assn. of Food & Drug Officials of the U. S., 15, (3), 82, 1951. Note: While this article specifically refers to use of silicone-treated papers in candy making, Dr. Lehmann has since indicated that FDA has no objection to their use in processing and packaging other foods.

UNIQUE silicone-treated paper eliminates greasing of baking pans. Paper then serves as carton liner.



PACKAGING TOO, uses the non-sticking compound. It cuts wax, plastic, and glue build-up on machine parts.

93-SCORE BUTTER is gently blended in kneader-type mixer, then scaled, before being worked into dough.

Makes "Gourmet" Cakes By Mass Production

Specialty quality baker sets pace by using finest ingredients, kitchen baking techniques, and advanced machinery and devices

JOHN V. ZIEMBA
Associate Editor, "Food Engineering"

"We get home-baked flavors in our gourmet-type cakes through old-fashioned processing techniques, advanced equipment, and the finest ingredients." In that statement, Charles W. Lubin presents the keys to the outstanding success of Kitchens of Sara Lee, Inc., Chicago, of which he is president.

Here's what Mr. Lubin means by "finest ingredients"—93-score butter (nearly ¼ lb. in each cake), fresh whole milk, pure cream cheese (nearly ¼ lb. per cake), and farm-fresh eggs. During 1954, the firm consumed over a million pounds of 93-score butter.

Not only are Sara Lee's standards high, but a quality-control laboratory makes sure that every cake reaching consumers uniformly meets those standards.

Pointing up the bakery's advanced processing lines, Jack Kollman, vice-president in charge of operations, observes that: "Our firm constantly experiments with—and even develops—new baking equipment. Company-developed were an automatic nut spreader, egg-wash applicator, cheese-cake filler, and icing machine* (for creating a lacy pattern for topping on coffee cake).

"A machine is used where it performs better than a highly skilled baker, and particularly when it provides us with more uniform quality cakes."

Kollman reports, too, that Sara Lee, worked with Ekco Products to originate the aluminum foil pan with laminated cover to protect its products. Cakes are baked in pans in which they are sold, thereby making the product more sanitary, assuring delivery in good condition, and reducing handlings.

To complete picture of Sara Lee's successful techniques, let us look at the operations: first, we'll take the baking of light and flaky all-butter coffee cakes (3,000 of them hourly):

Flour is charged into a portable

* Patents pending on first two machines. Others patented.

It Grew and Grew

The Sara Lee cake business started less than five years ago with little more than a big idea. The idea was to bake a cake no woman could duplicate for the same price, and make it available close to her home.

From its original limited distribution in the Chicago area, the bakery expanded coverage until its products now are sold by thousands of chain and independent food stores and supermarkets throughout the country—as well as in the finest restaurants and hotels.

Volume steadily increased from $400,000 in the first year of operations to $1,000,000 in 1952, and over $3,000,000 in 1953. The company expects to exceed $5,000,000 this year.

Consumers have demonstrated less sales resistance to the 79¢ price for a premium Sara Lee cake than toward an "ordinary" 39¢ cake.

HERE, the blended and scaled butter (nearly ¼-lb. per cake) is rolled and folded into dough that then rests in cooler.

SKILLED BAKERS fold in filling. Dough is then run through sheeter (A), cutter (B) that slices it into strips, and onto packaging line (C).

sifter-blender that's hoist-elevated for delivery into 800-lb. kneader-type mixers. These mixers were selected to simulate gentle hand-kneading of dough and assures light-textured baked goods.

Batch-weighed in a special scaling room and into aluminum ingredient containers are sugar, salt, seasonings, etc. Scaled ingredients are added along with flour loaded in kneader-mixers.

The Rich Danish

Manual make-up operations assure a rich Danish-type coffee cake, with maximum butter formulated into doughs to end up with 81 layers of a flaky-thin pastry.

Racks of the hand-rolled dough are transferred into a refrigerated room for the dough to rest overnight. As a safeguard, metal tags (with rack number and date of make-up) are attached to racks. Next day, doughs are again hand-rolled several times to make them even more light-textured.

The filling—which is a company-prepared blend of cake crumbs, butter, cinnamon, and other seasonings—is uniformly spread over dough sheet, then the sheet is folded and run through a make-up machine.

Here, a pair of rotating metal rolls sheet the dough into uniform thickness, and a vertical, reciprocating knife cuts the belt-conveyed sheets into strips. Hand-twisted, these strips are fed onto a conveyor going to the panning station.

Uniform delivery of dough strips is achieved by a simple company-devised vertical divider installed over the conveyor belt. This unit separates single-row of strips into two rows and then into four. Girls arrange two twisted strips into each circular, aluminum foil pan (9-in. dia.).

Dispensing of foil pans is facilitated by a simple device that also betters housekeeping practices. Located to left of each girl, this unit is a just-above-the-floor rod-type pan holder-

Fit for a Gourmet

There are three Sara Lee cakes on the market—cream cheese, all-butter coffee, and all-butter pound cakes. At Christmas, the company produces a special fruit cake. The cakes are fresh-delivered within a 300-mile radius of the Chicago bakery, and frozen to other parts of the country.

1. **Cream cheese cake**—This first Sara Lee product has become a popular American dessert. Each cake contains Kraft's Philadelphia brand cream cheese, carefully blended over a graham cracker crust and covered with a special topping.

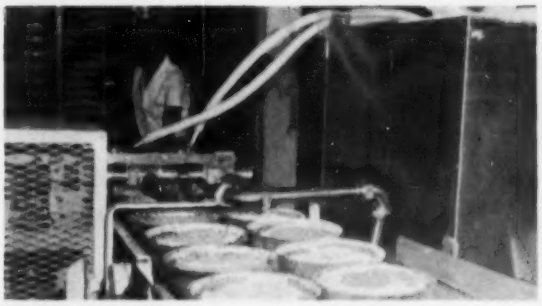
2. **All-butter coffee cake**—A true light Danish pastry made in the old-fashioned way of layer-upon-layer of flaky-thin pastry. Coffee cake is "built-up" of 81 individual layers of pastry, and topped with sugar icing and pecan halves. Nearly ¼ lb. of 93-score butter goes into each cake. Butter is rolled into dough, as are cinnamon and other flavorings, so that every piece of cake tastes exactly alike.

3. **All-butter pound cake**—Newest of the Sara Lee products, it fulfills demand for a high-quality cake of a versatile type. It is concocted with only pure food ingredients, including 93-score butter and farm-fresh eggs, and contains no artificial flavorings or colorings.

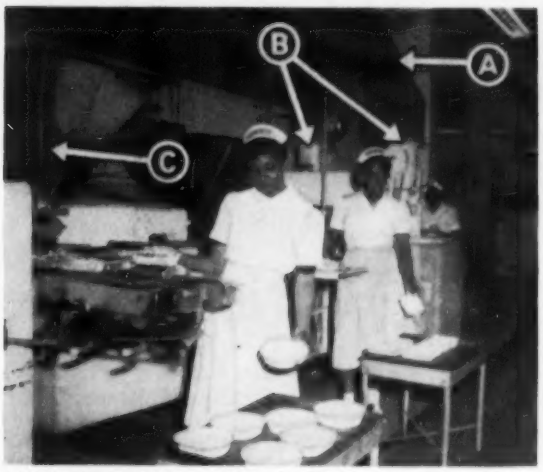
4. **Fruit cake**—This heavily fruited cake is made with whole fancy glace cherries, Hawaiian pineapple, imported citron, California Sunkist orange peel, raisins, and pecans. The cake makes its appearance on food store shelves each September, in time for the holiday market. Fruit is soaked in brandy and sherry and aged in brandy barrels before baking. These cakes keep almost indefinitely.

THESE are taste-tempting cakes that are mass-produced.

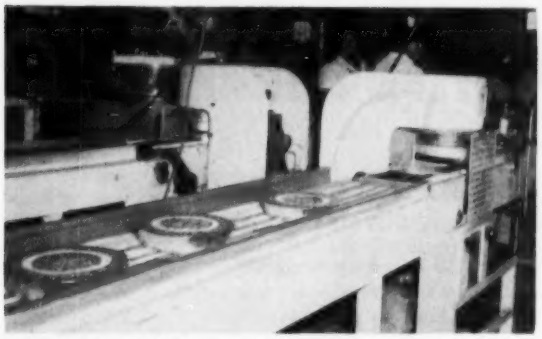
BAKED CAKES are removed from 75-ft. tunnel-type oven. Note special baking trays.



PATENTED icing machine automatically applies a lacy pattern on belt-conveyed coffee cakes.



2-IN-1 cheese-cake machine handles small rectangular and large round foil pans at 30-per-min. rate. Graham cracker crumb mix is bucket-conveyed (A) to hoppers (B) supplying dispensing unit. From stainless hoppers (C), cream cheese is volumetrically fed into pans. Addition of sour cream topping follows.



LAMINATED LIDS are applied over foil pans and then machine crimp-sealed at 30 per min.

dispenser. A stack of foil pans is loaded into each unit.

Special Units

Pans are then placed, six to a specially designed baking tray. These trays are embossed with two strategically spotted 8-in. dia. sections. The purpose is to prevent pans from sliding and permit use of company-devised machines for uniform distribution of egg wash, pecan halves, and icing.

Trays fed onto a chain-belt are carried through an egg-wash machine. Pneumatically operated, this machine uniformly sprays egg-wash mix on top of the cakes, two at a time—and without any getting onto the trays. A microswitch attachment prevents the mix from being wastefully sprayed when panned coffee cake dough is not under dual spray heads.

Trays are transferred to an automatic nut-topping machine. A volumetric unit, this topper delivers uniform amounts of choice, selected pecan halves onto cakes, two at a time.

Now the trays are loaded into a 75-ft. tray-type gas-fired oven with automatic temperature controller-recorders. After the bake, trays are placed onto portable racks to allow the cakes to cool before icing is machine-applied.

Icing is made up in a bowl-type mixer-cooker. Then the bowl is hoist-raised for direct loading of the hopper-feeding company-patented icing machine. Trays of baked coffee cakes are conveyed to this icing machine. And a perforated, horizontal, tubular-type depositor (mounted over the conveyor), applies many thin streams of icing (in lacy-fashion) on top of the cakes. Limit switches recirculate the icing to the hopper whenever a tray doesn't reach the tubular depositor.

Removed from the trays, pans of cake (14½ oz. each) are fed to a conveyor where girls place on covers. Pans continue to a crimping machine that handles 30 a min. After coding, the pans are packed into shipping cases that are glue-sealed.

To make Sara Lee cream cheese cakes, a company-patented machine is employed. Ingredients for the bottom crust—a layer comprising graham cracker crumbs, sugar, cinnamon, vanilla, and shortening—are loaded into an above-the-floor hopper. A short bucket elevator then transfers the crumb mix to a horizontal screw conveyor from which it is chuted to two hoppers on the cheese-cake machine.

Forming Cake Crusts

Foil pans (rectangular 11-oz. or round 20-oz. ones) are then fed, two at a time, onto a chain-belt conveyor that carries them under the two crumb-mix filling nozzles. Mix is automatically weighed and deposited into the foil pans.

Further along the line, a pair of round reciprocating metal disks level and tamp the crumb mix in the pans. Next, light and custardy cream cheese is volumetrically fed from stainless steel hoppers by piston fillers. Speed of this 2-in-1 line is about 40 packages per min.

Cakes are then covered with a layer of sour cream topping, placed

(*Turn to page 173*)

British Milk Plants Mechanize

Automatic lid raisers and can dumpers, empty can accumulators, casers and uncasers, aluminum cap formers are among advanced units. Delivery equipment includes pedestrian controlled and 3-wheel electric trucks

F. PROCTER

Dairy Manager, Birmingham Co-Operative Society Ltd., Birmingham, England

Shortages and higher costs of labor have brought about many outstanding developments in Britain's milk operations since the war.

And these developments have been further advanced by the fact that both the prices paid to the farmer and those at which milk is sold to the consumer are controlled by government agencies. This leaves an extremely small margin of profit for the dairyman.

Consequently, there has been an overriding need for utmost efficiency. One result has been the almost complete elimination of dairymen who retailed between 1,000 and 2,000 imperial gallons of milk per day. Their business has been absorbed by the very larger operators who could afford to purchase and install new labor-saving equipment.

In these larger plants technological advances are equal, and in some cases, ahead of American practices.

Receiving Automated

Due to the small size of the country, it is customary for bottling plants in Britain to receive practically all of their milk direct from farmers in 10 or 12 gal. (imperial) cans.

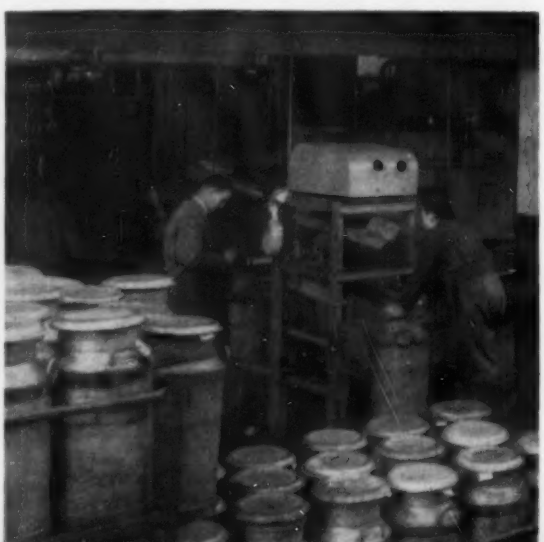
In the most modern dairies automatic lid raisers have replaced the manual operation of loosening lids with a hammer. Cans then go to dumpers where they are automatically emptied (at up to 1,200/hr.), drained, and conveyed to straight line washers.

Leaving the washers, lids are placed on the cans which then move onto accumulators which store up to an entire truckload of empties. This is a space- and time-saver as it enables the truck driver to unload his full cans without handling the empties. He then moves to the accumulator to pickup the empties, and another truck starts unloading.

Milk Processing

In the processing operation, plate-type heat exchangers are largely used. For sterilized milk, which is being consumed in increasing quantities, the so-called "ultra high

CANS of milk are unloaded onto platform then move through lid raiser which automatically removes covers.



BRITISH DAIRY PLANTS have extensive facilities for receiving cans of milk direct from producers. In them, full use is made of advanced equipment to offset the scarcity and high cost of labor.

For Efficiency

temperature" plate units are employed, although some of this product is heated directly to 275 F. in crowned bottles.

Cases have been completely standardized as to size, and hold either 12 quarts, 20 pints, 24 or 30 half-pints, or 30½-qt. bottles. Cases are made of metal, either open-frame strip or wire, and stacking is always possible regardless of the manufacturer. Bottleneck sizes have been standardized at 26, 36, and 38 mm. This further simplifies automatic operation.

A number of equipment manufacturers build uncasing and casing units. With these, manual handling of bottles is practically eliminated. Trend in bottle washers is to very much larger sizes. It used to be customary to operate machines with capacities of 6,000-8,000 bottles per hr. Now the larger dairies have installed washers with outputs of 12, 16, 20, or 24 thousand bottles per hour.

Aluminum caps, stamped directly from rolls of foil, are used for pasteurized milk. However, the new color-printed aluminum "synchro" caps are gaining in popularity. Electronically controlled machines attached to the filling line make and apply these caps at the filler. Prefabricated caps, such as the Dacro, also are used.

Attention is being paid to "in-place" cleaning of pipelines. The system has now reached the point where electronically controlled cleaning operations are about to be adopted.

Distribution Improved, Too

For delivery of milk, the old push trams of prewar years have entirely disappeared. And, although some horse delivery is still found, most of the vehicles are propelled by electricity.

Types of electrically operated delivery equipment include pedestrian-controlled trucks with 42-case bodies, 3-wheeled trucks that have replaced horse-drawn wagons, and 4-wheeled trucks of medium and large sizes. For longer distances, 2-3 ton diesel operated trucks are used.

Retail trucks are built with low, wide bodies to give the driver ready access from the street.

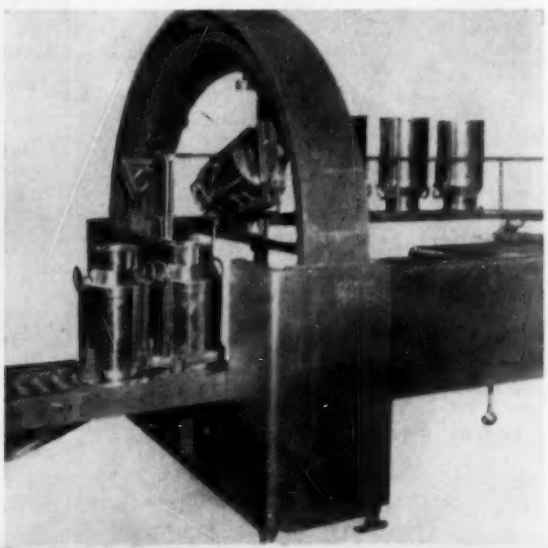
Laboratory Methods

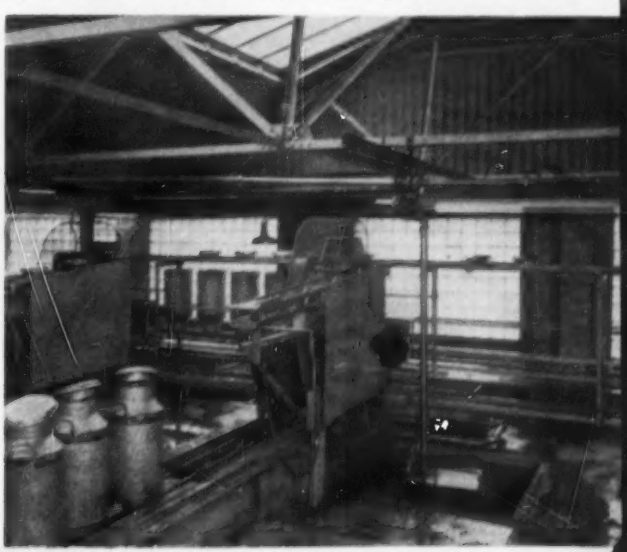
In the dairy laboratory, the method of counting bacteria on Petri plates has been largely supplanted by inexpensive dye tests (resazurin and methylene blue) for both raw and pasteurized milk. The Astell "mechanical roll tube" method for counting bacteria in swab tests and rinses of bottles, cans, and equipment has also found high favor.

The new hydraulically operated centrifuges for Babcock and Gerber fat tests is proving far superior than previously built ones.

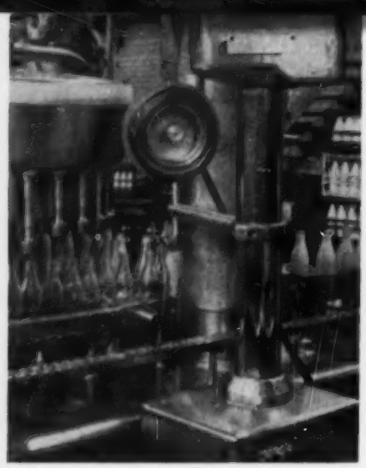
Turn Page for Additional British Units ⟶

DUMPERS automatic receiving operation. Lanko unit (left) handles 1,200 cans per hr. Right photo shows dual installation in which cans are drained as they are conveyed from dumpers to straight-line washer (extreme right).

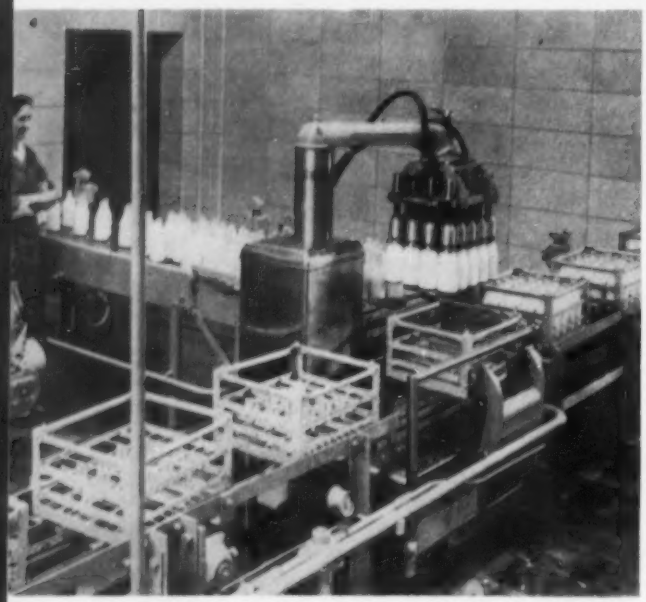


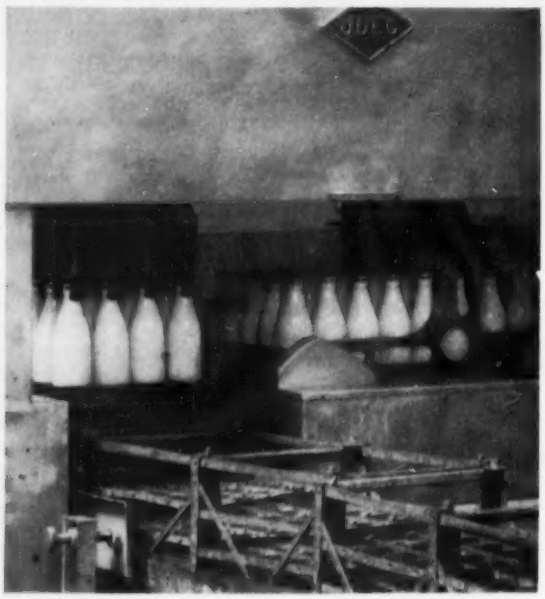


ACCUMULATOR receives cans from washer, stores entire truckload while driver unloads filled ones. This greatly speeds receiving operation.

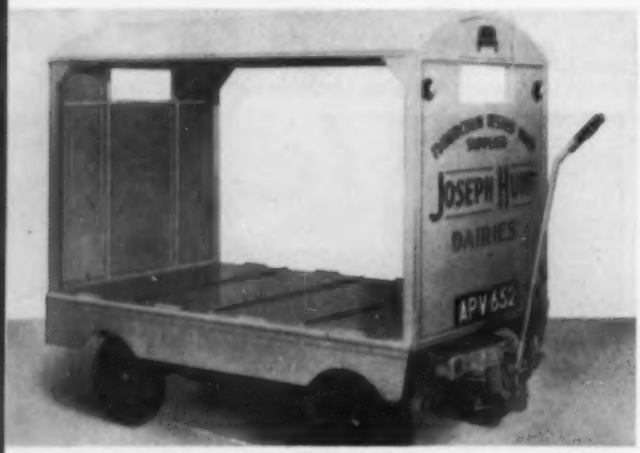


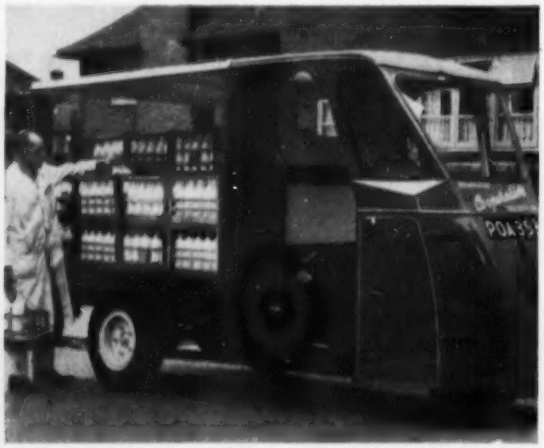
CAPS are made and printed by electronically controlled unit.



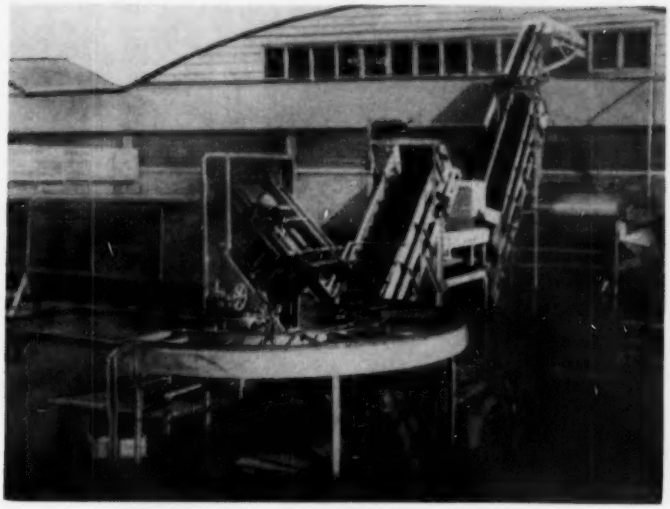


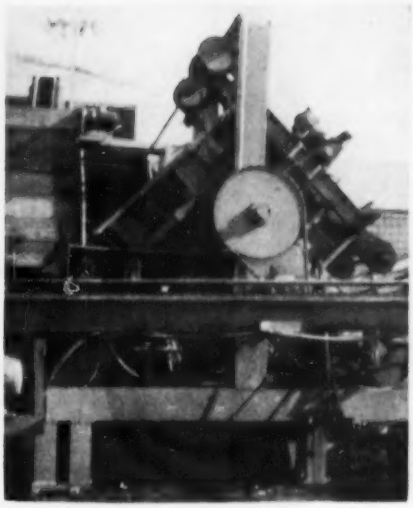
AUTOMATIC CASERS eliminate full bottle handling by assembling case lots and lowering into metal cases. Unit left made by Graham-Enock Mfg. Co., Ltd., one at right by U. D. Eng. Co. Ltd.

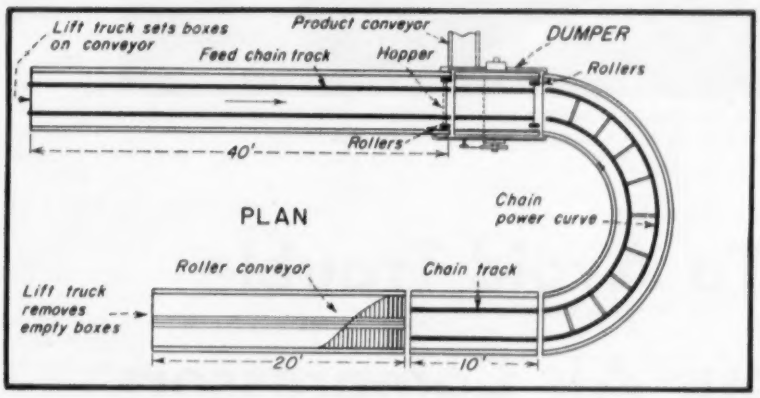




ELECTRIC delivery vehicles have replaced hand-push prams and horse-drawn wagons. Left: Pedestrian-controlled one-ton unit has space for 42 cases. Right: Three-wheeled truck hauls load of formerly-used wagon.







TOP LEFT: Boxes of fruit are fed to dumper from conveyor (left). Empties discharge to circular conveyor (foreground). Fruit is elevated to packing house (rear). Above: Dumper turns box allowing fruit to fall into water hopper.

LEFT: Schematic of dumping system. Filled boxes are placed on end of feed chain, then move to dumper where content discharges into product hopper. The U-shaped conveyor moves empty boxes from dumper to rollers. Proximity of feed and discharge points enables one fork truck to handle both full and empty boxes.

Continuous Box Dumper Speeds Product Handling

West coast packer unloads 25% more fruit with unit that automatically dumps 2,000 lb. boxes

FE STAFF

New materials handling concept, the continuous dumping of 2,000 lb. tote-boxes, has replaced a mechanical apple box dumper and increased capacity from 30,000 to 40,000 lb./hr. at Tea Garden Products Co., Grandview, Wash.

The unit requires one man with a lift-truck instead of the two to three men formerly needed. Additional savings accrue from use of these sturdy boxes as compared to the relatively fragile apple or lug boxes.

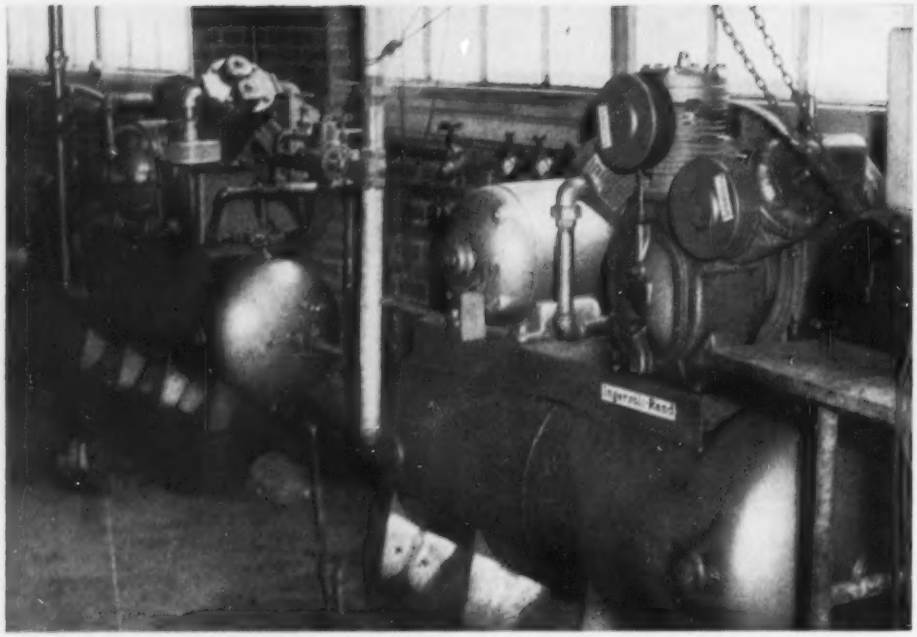
It is manufactured by Food Machinery & Chemical Co., Yakima, Wash., and consists of a series of conveyors and a mechanized dumper.

Movements of conveyors and dumper are controlled and synchronized by limit switches. Speed of dumper operation is regulated by adjustable contacts in a cam which control motor operation. Contacts also are set to control number and time of pauses made in dumping cycle.

Thus product is dumped as rapidly or as slowly as desired—with minimum product congestion in water hopper or on take-away conveyor. Feed-in and discharge of boxes are regulated by the dumping cycle.

As many as nine (4 ft. x 4 ft.) boxes may be placed on the chain track feed-in conveyor, which feeds single boxes to the short chain-track in the dumper carriage. Boxes moving from

(Turn to page 174)



BECAUSE these machines are installed in accessible place near light, and where there is good air circulation, machines will get more attention, do better job, last longer.

How To Avoid Trouble With Your Air Compressors

F. J. McCLOUD
Chief Engineer

Should you reduce pressure?
Where to install compressor.
How to pipe air receivers.
Ways to avoid overheating.
Tips on finding air leaks.
Do you need aftercoolers?
How to size your new machine.
Precautions against explosions.
Installing suction and discharge lines for best performance.

One of the most reliable work horses in a food processing plant is the air compressor. Yet I'm always surprised when visiting food plants to find how little attention is given to this machine.

Air compressors often are misused, incorrectly installed, and neglected. Because they keep running with little attention, many plant maintenance people forget them entirely—until they finally give up the ghost and stop. Then you find yourself with a big maintenance bill on your hands. Or you may have to buy a completely new machine.

But you can avoid that expense by giving your compressor the kind of attention it deserves. Here are practical pointers:

Capacity—One common mistake is to "save" money by buying air compressors too small to handle both the capacity and pressure needed. Then to "correct" this situation, some bright mechanic speeds them up to run above design pressure. At that point, things start going haywire.

To size your compressor, check up on all your air needs. Then buy a unit with 50 percent larger capacity. That permits you to handle plant expansion without wrecking your machine. Such an over-sized machine also does a better job without overheating. That means long life with few maintenance bills.

Location—Too often I find a small air-cooled compressor hidden away in a remote "hole-in-the-wall." There, the machine heats up because there isn't enough air circulation around it. What's more, a compressor shoved into a tight place is hard to maintain. Your people just naturally won't stand on their heads to give it proper attention.

To avoid such problems, place your machine where it has plenty of fresh air. Then operation is also easier to check. If the unit is water-cooled, put it where it has continuous supply of needed cooling water. While a compressor is being installed, watch the men doing the job, and ask questions. Once the machine is installed and paid for, it's your baby.

Aftercoolers—Aftercoolers often are installed as a "cure-all" to take care of some of the mistakes I mentioned before. But aftercoolers can be a waste of money—both in original cost and in water bills—if not given intelligent consideration.

One common trouble is that the air discharge piping from compressor often runs through the hottest part of

the plant. Also, air receivers (air tanks) often are installed in hot spots near boilers, or the receiver is completely by-passed. Instead of the air line running into the receiver at one side and out the other, it merely has a connection to it. Then air and moisture go directly to your costly and delicate instruments and other plant services. When so piped, your air receiver acts only as a storage tank and cannot remove moisture and oil from air. Oil passing from compressor into your air lines will deteriorate the rubber diaphragms of reducing valves, perhaps spraying oil on food being processed, resulting in costly damages.

Compressors overheat from dirty air-suction strainers, or because the suction strainer is placed where it can draw in only hot air. This is bad for the compressor. Besides getting hot, the unit does less work. Hot air being lighter, less air is drawn in with each stroke. So the machine must run longer to do same amount of work.

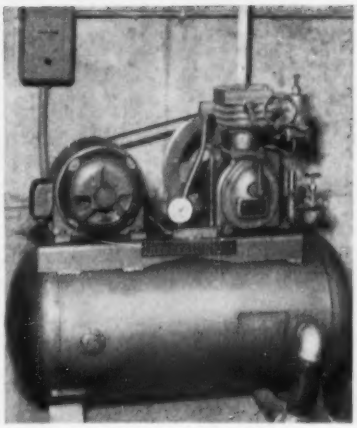
These faults are easily remedied. Aftercoolers are used to cool the air after it leaves the compressor. Moisture is then condensed out of the air before it goes on to your instruments and other equipment. If the machine is right for your job and the piping is OK, an air-cooled aftercooler will suffice for most plants.

But I have visited many large plants that didn't need their aftercoolers. All they had to do is pipe the machine so that suction air is taken from a cool part of plant, or from outside of the building, then run the discharge line through cooler spaces before reaching the receiver. Air should go into the receiver or storage tank near the middle and be removed near the top. Never pipe into receiver and use the same line for discharge. And it helps to have the receiver on the coolest side of plant. Tanks surface can get rid of a lot of heat.

Reducing air pressure—Many plant engineers I've talked with buy a compressor to supply air at the pressure needed for service. Then because they have excess moisture in the supply air, they install all kinds of gadgets to remove this moisture. Often, you can avoid this extra expense by buying a compressor that supplies a higher pressure than required, then you lower the air pressure reducing valve.

When air pressure is reduced, it tends to grab more moisture. If moisture is not available, the expansion (or pressure reduction) lowers the humidity. With a shop line at 80 psi., for example, install a 150- to 175-psi. compressor. Then moisture is held in the receiver.

Place a reducing valve in your shop line. Then air will be dry enough for most of your services.



SMALL COMPRESSORS come as a complete unit. About the only thing to watch is location and to make sure piping is right. But don't forget machine.

Explosions—Every now and then I read in some insurance magazine that oil in the discharge line of a compressor exploded. This isn't always from faulty hookup—although that happens, too. In most cases, compressor cylinder oil will discharge with air from the compressor. Explosions take place because the oil used in compressor is a poor grade lubricating oil, with flash point well below the safe limit. Or the compressor may not be designed right for your service. Here the discharge-valve temperature exceeds that recommended for good practice. Often the discharge valve leaks badly.

Small air-cooled compressors usually have a fan-type flywheel. They are designed to flow cooling air across the cylinders and across the intercooler. Many users put such compressors in an enclosed area. If the space is closed off, the fan can pick up no cool air. Or users place the flywheel with its fan against the wall, where air cannot get to the fan to circulate and cool the machine. When I ask why the wheel is against the wall, I get this answer: "Why, to protect our personnel from being hurt with the flywheel, of course. You see we are very safety minded." Fine, except that the machine overheats.

Here is a way to prevent explosions from oil in discharge lines. Ask your oil dealer for a good grade of oil with a safe, high flashpoint. Some characteristics of such oils are listed in the following table:

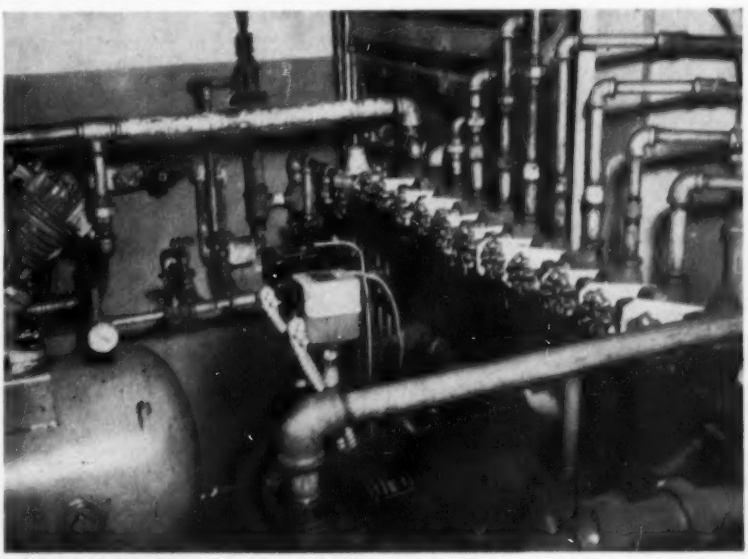
CHARACTERISTICS OF SAFE COMPRESSOR OIL

	Napthene or asphalt base	Paraffin base
Flashpoint (open cup)		
375 F. minutes	400 F. minutes	
Viscosity at 100 F.,		
ssu 250 to 450	250 to 400	
Pour point		
5 F. maximum	30 F. maximum	

When installing a new machine, buy nothing less than a good compressor—with finned cylinders if it is an air-cooled job. See that the flywheel fan is large enough to cool it when installed in your plant. If the unit is a two-stage job, make sure that the intercooler is finned. Remember that it pays to buy good equipment the first time.

Another thing—don't expect a compressor that's designed for 150 psi., of perhaps 25 cfm to work at 175 or 200 psi. Also, don't speed the ma-

(*Turn to page 143*)



AIR COMPRESSOR in large Loft candy plant has manifold with individual master valve for each service line to plant.

VIBRATING SCREEN is used to remove hops residues from yeast, which subsequently is washed.

INSTRUMENT-CONTROLLED COOKING of washed yeast in these 450-gal. stainless-steel kettles assures high yield of extract. Operator is seen checking pH of batch. Note temperature controllers in background.

Converts Waste Yeast

Danish brewery neatly disposes of spent yeast

GEORGE WILLIAMSON
McGraw-Hill World News, Stockholm, Sweden

Profitable utilization of waste yeast is most notably reflected in the operations of Vitamon A/S, a subsidiary of Tuborg Breweries Ltd., Copenhagen, Denmark.

By skillfully integrating production of soup extracts, dry soups, and dried yeast with the brewery operation, this efficient setup enables—

1. Disposal of all of Tuborg's spent yeast plus that of two neighboring breweries.

2. Flexible use of brewery labor and managerial time.

Annual throughput is about 2,500 tons of waste yeast. Of this, approximately 1,500 are used to produce some 300 tons of pure dried for animal feed and medicinal purposes. The remaining 1,000 tons goes into soup extracts and dry-soup powder and cubes.

At peak production, Vitamon employs 24 workers and a foreman, but labor can readily be switched to the bottling plant or vice versa. For example, at the height of the brewing season when less waste yeast is available, slack labor is used in the bottling plant.

Furthermore, nature of the products (all yeast derivatives) permits day-to-day adaptation of production to demand. Thus it is a simple matter to switch from manufacture of extract to dry soups.

Economic use of managerial time is another plus factor. The 6,500-sq. ft. working area is at one end of a three-floor building. It is adjacent to the bottling plant and, therefore, under the close control of a single supervisor.

Yeast Extract

Processing starts with cleaning of the yeast in the brewery. Tuborg has been using its own special strain for some 20 yr., a flocculating type that permits a comparatively high volume of yeast to be drawn from the fermenters.

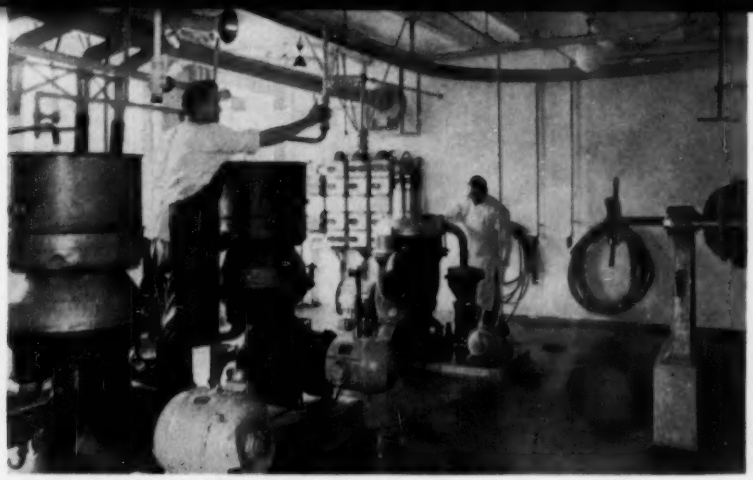
After each fermentation, yeast is cleaned in a specially designed vibrating screen—an important step in the preparation of soup extract. In addition, removal of hops residues improves flavor of the beer.

Between fermentations, it is held in stainless-steel tubs in a white-tiled room kept at surgical purity. Even the 35-deg. air is filtered. After eight to ten applications, spent yeast goes to the Vitamon plant.

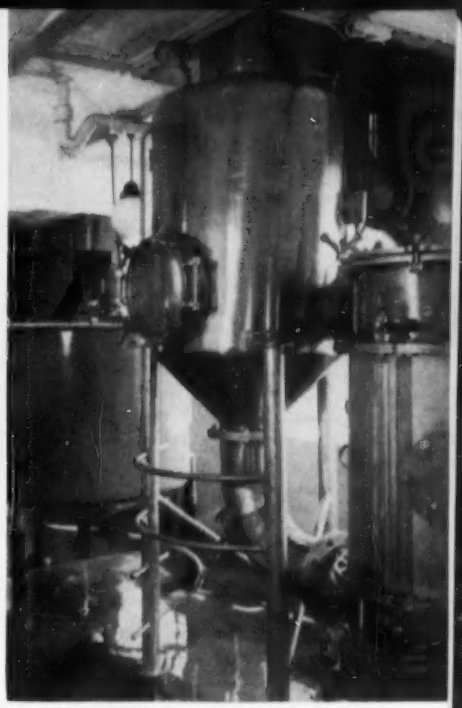
Special tank-trucks transport the yeast within the Tuborg premises, and also haul it from the other breweries. Each of these trucks has a 5-ton stainless-steel tank which is permanently inclined at a 15-deg. angle for complete discharge. After each shipment, it is thoroughly hosed by a worker who enters through a top man-hole. From the tank-truck, yeast is pumped into one of five 5-ton aluminum tanks.

Making Dry Soups

OPERATOR loads tray dryer with pans of paste made of concentrated yeast extract, seasonings, and fat. Material is spread in a thin layer, dried at 221 F., and then ground to a powder.



BATTERY OF CENTRIFUGES separates yeast cells from the extract, which after cooking is rich in vitamins B_1 and B_2. Clarified liquid is pumped to buffer tanks before being evaporated.



COMPANY-BUILT EVAPORATOR is made of Inconel to curb corrosion and product contamination.

to Profitable Products

in subsidiary processing of soup extracts and powders

Within 24 hr. it goes directly to process. First, it passes through another vibrating screen on the way to washing tanks. Then, after thorough washing, yeast is centrifuged to remove water. Employed are three centrifuges, each with a capacity of 130 gal. per hr.

Next, product goes into two 450-gal. stainless-steel vats equipped with heating mantles and accurate temperature controls. Here, contents of the yeast cells are dissolved to enable a high yield of extract with highest possible concentration of vitamins B_1 and B_2. Cell walls are then removed by centrifuging, and clear solution goes to buffer tanks before being evaporated.

Precise evaporation is the key to the process. This is accomplished in a company-designed unit having a capacity of 184 gal. of water per hour at an average temperature of 125 F.

Because of the low pH and high salt content of the soup extract, selection of suitable materials of construction for the evaporator was a specific problem. This concerned not only the matter of corrosion but product quality as well, since even minute quantities of dissolved metals adversely affect the flavor. As a result, Inconel was chosen as the principle metal for the evaporator.

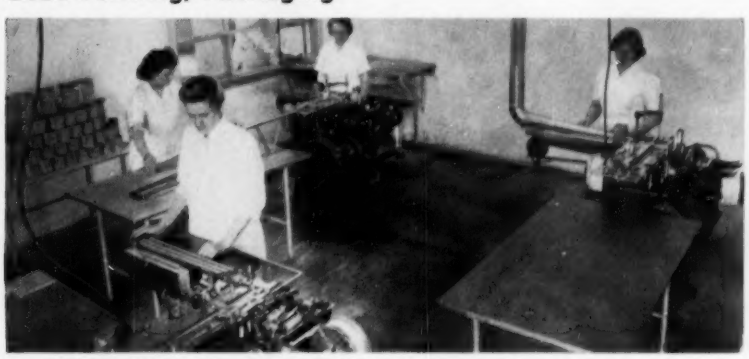
And the same problem applies to all vessels used in the process. Storage tanks for finished extract are coated with Lithcote, a synthetic resin that withstands high temperature as well as corrosive attacks of acids, alkalis, and salts.

From the evaporator, extract goes to balancing tanks for alkalizing to the final pH. Product is stored for two months, during which the flavor changes considerably on aging. There are ten storage tanks (6-ton each) for holding up to 360 ton of extract a year.

Vitamin content of the finished extract is accurately controlled by fluorometric methods.

After storage, product is filtered and then bottled by a semi-automatic, 4-head filler. The 6-oz. bottles have an ordinary beer-bottle neck and are crowned with beer caps.

Cube-Forming, Packaging



AT 150 PER MIN., cube-making unit (right) compacts soup powder into ½-in. cubes. They are individually wrapped (rear), then packaged in groups of five (foreground). Final package is tin container (left).

Soup Powder, Cubes

To convert the aged extract to dry-soup powder, the former is further evaporated to a paste which is then mixed with salt, sugar, seasoning, and vegetable fats. Vitamon makes its own vegetable extracts every fall for use throughout the year. The dry soup also contains a considerable amount of decomposed protein and a large quantity of phosphates.

Finally, this mixture is spread in thin pans and dried for 2 to 3 hr. at 221 F. The material rises to a thick cake, which is then ground into powder.

At this point, the product is either packaged as a powder or diverted to

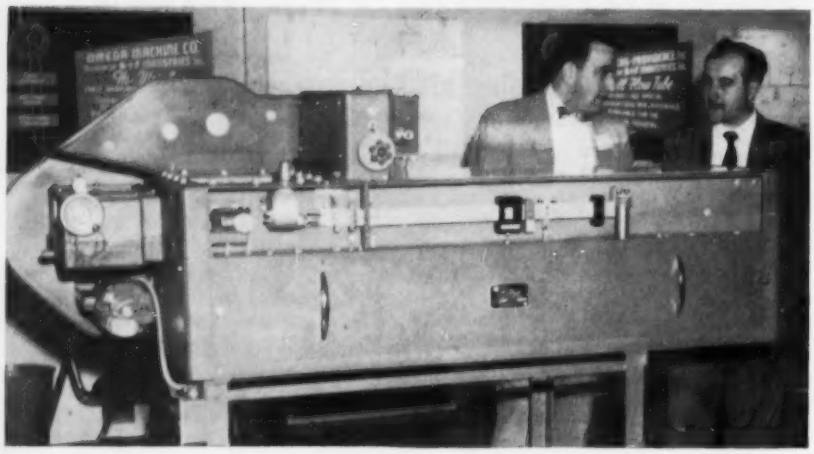
(*Turn to page 154*)

23 NEW Food Machines At Chem Show

FE Camera reveals advanced units for packaging, processing, controlling, handling at Philadelphia Exposition

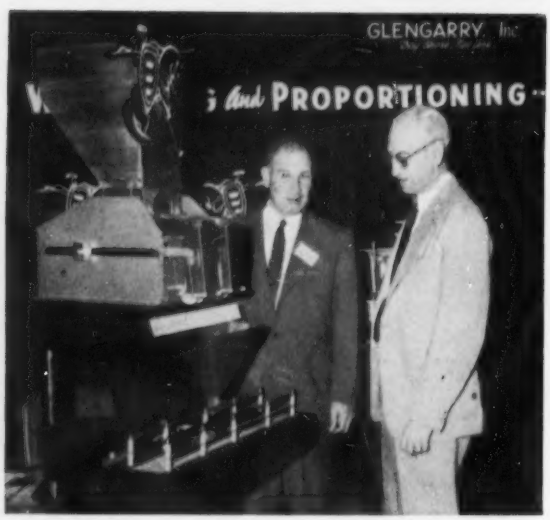
Weigh Feeders and Checkers

NET WEIGHER combines high accuracy, compact design, air-operated throttle-controlled dumping mechanism, wide opening weigh hopper, precision controls. Capacities from 1-oz. to 10-lb. Push-button or automatic operation.—Exact Weight Scale Co., Columbus, O. (66A)



CONTINUOUS, accurate feeding large quantities of dry materials is characteristic of new Hi-Weight belt gravimetric feeder. Unit features low head room, extra large weight span, removable clean-out pan, belt cleaner, sampling gate. — Omega Machine Co., Providence, R. I. (66B)

INCREASED SANITATION is achieved in new checkweigher by mounting all controls above conveyors. Handles 100 packages/min., rejects under and overweight ones.—Exact Weight Scale Co., Columbus, O. (66C)

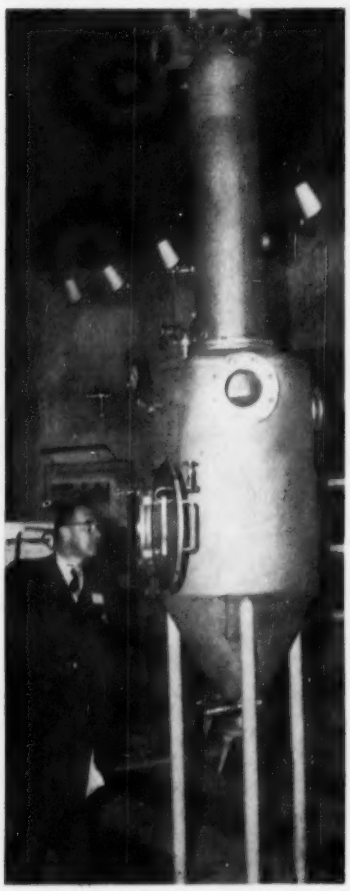


WIDE RANGE of weights—1 oz. to 5 lb.—and extreme accuracy are features of new 2-station weighing unit with operating speeds to 40/min.—Glengarry Processes, Inc., Bay Shore, N. Y. (66D)

NEW solid bowl centrifuge designed for fragile crystals and fibers employs reciprocating conveyor that sweeps across the bowl and discharges from either end.—Bird Machine Co., S. Walpole, Mass. (67A)

CENTRIFUGE combines action of centrifugal force with an increasing-diameter screen for rapid separation of slurries. Capacity: 12,000 lb./hr.—Merco Centrifugal Co., San Francisco. (67B)

7 Processing Units



CONCENTRATOR carries heat-sensitive items to high solids content. Water is rapidly evaporated from thin turbulent film in single downward pass.—Blaw Knox Co., Buffalo 11, N. Y. (67D)

INTIMATE MIXING and/or size reduction are performed as particles are thrown outward between two rotating steel disks in new impact mill.—Entoleter Div., Safety Car Heating & Lighting Co., New Haven. (67C)

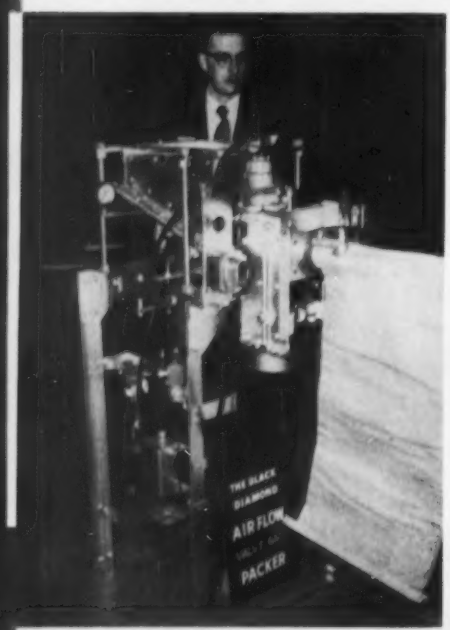
VERSATILE FILTER PRESS has roll-over design permitting bottom-inlet operation for firm cake, then 180-deg. rotation for drainage. Stainless unit, employing filter cloth or paper and filter aids, recommended for clarifying or polishing.—Star Tank & Filter Corp., New York. (67E)

Turn page for more units ➞

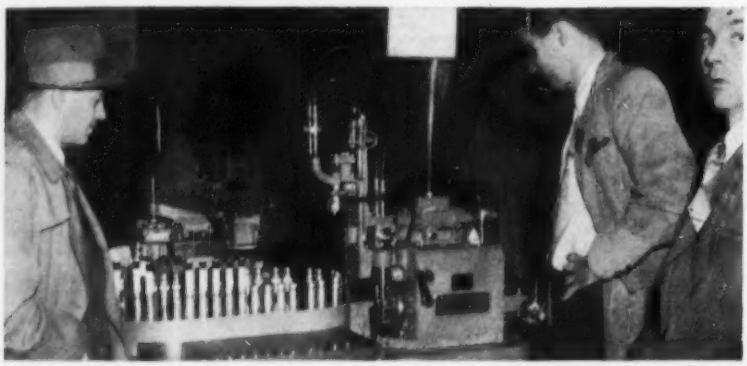
CONICAL MIXER has revolving screw that thoroughly blends small quantities of additives, dissolves solids. Screw reverses for discharge. Body can be jacketed.—Blaw-Knox Co., Buffalo 11, N. Y. (68A)

FULLY SANITARY homogenizer-dispenser features product-fitted rotor-stator combinations, improved impeller infeed and discharge. Easily disassembled for cleaning.—Tri-Homo Corp., Salem, Mass. (68B)

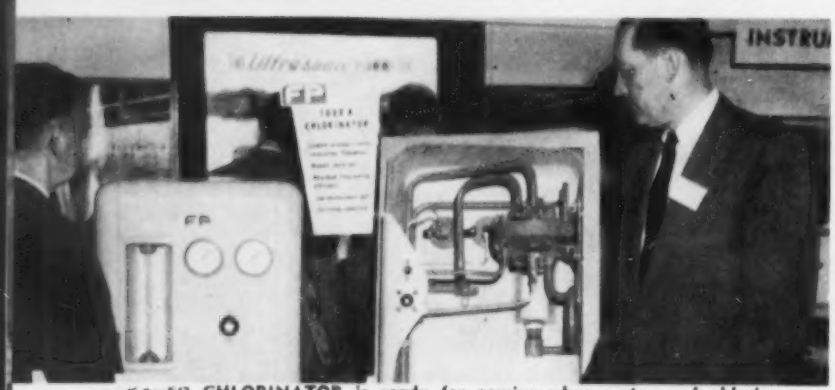
2 Fillers, 2 Chlorinators



BAG PACKER (left) combines air-slide conveying with weight-control for accurate filling. Bag sizes: 10-125 lb.—Black Products Co., Chicago 27. (68C)



TUBE FILLER (above) packages pastes, powders, and liquids in tubes up to 1½x7¼ in. at 55/min. Fills from bottom up to prevent air pockets, then closes and crimps. Twin model also available.—Colton Co., Detroit 7. (68D)



PACKAGED CHLORINATOR is ready for service when water and chlorine connections are made. Safety devices shut down equipment in event of abnormal operation. Corrosion-resistant components simplify maintenance. Unit is quickly converted to automatic operation in the field. Capacity: 0.1-1,000 lb. per day.—Fischer & Porter, Hatboro, Pa. (68E)

VERSATILE CHLORINATOR adapts to manual or proportional automatic control, delivers 0.8-400 lb. of chlorine/day.—Wallace & Tiernan, Inc., Belleville, N. J. (68F)

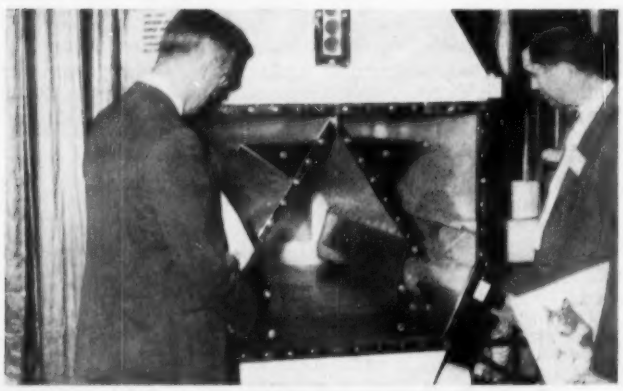
3 Control Devices

FLOW METER uses gyroscope to gage fluid streams on weight basis, hence independently of temperature, pressure, or viscosity. Applications include process control, automatic batching, blending, and proportioning.—Norwood Controls, Norwood, Mass. (69A)

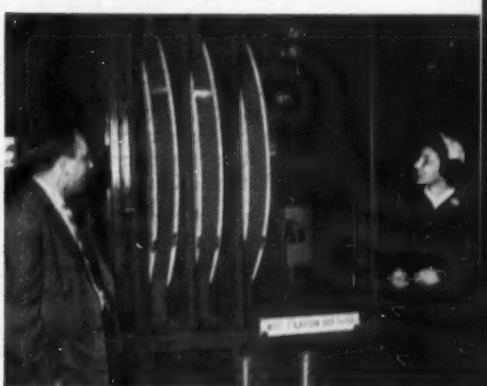
PNEUMATIC CONTROL has linear output speeds for automatically regulating temperature, liquid level, pressure, and proportional flow. Unit employs valve positioner and piston to continually correct operating speeds.—Reeves Pulley Co., Columbus, Ind. (69B)

COLORIMETERS use photoelectric principle to measure color intensity and turbidity. They detect haze in finished beer, thus check filter efficiency. Instruments indicate in percent transmittance and will operate a potentiometric-type recorder or alarm system. Unit (right) has 25-cm. path length.—Beckman Instruments, Inc., Fullerton, Calif. (69D)

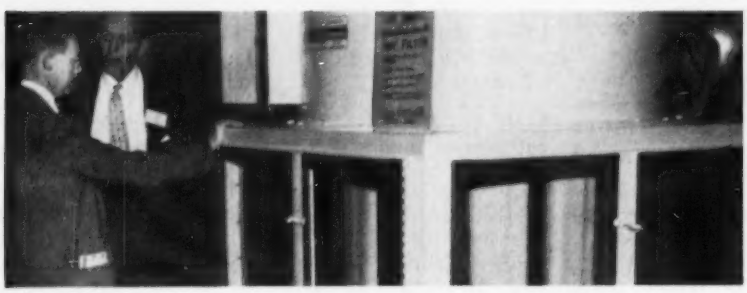
3 Dust Collectors



DUST COLLECTOR increases flexibility, cuts maintenance. Centrifugal force mixes dust-laden air with water. Capacities: 750-50,000 cfm.—American Air Filter Co., Louisville, Ky. (69C)



FILTER DRUMS of dust collector are automatically cleaned by air jet. Sizes: 520-7,200 cfm.—Koppers Co., Baltimore. (69F)



DUST FILTER is automatic-continuous unit incorporating high-velocity, reverse air cleaning of sleeves. For pressure or vacuum operation, it handles 500-1,200 cfm. of air and requires small floor area. Can also be mounted on casters.—The Day Co., Minneapolis 13. (69E)

Turn page for more units →

2 Conveying Units

SPIRAL ELEVATOR operates at natural frequency of its springs to cut power requirements. Applications: Vertical conveying, cooling, drying, and separating. Unit is available in stainless.—Carrier Conveyor Corp., Louisville. (70A)

VIBRATING CONVEYOR, a lightweight unit offered in 5-24 in. deck widths, comprises 12-ft. bolted sections. Equipment has quiet, gentle action, is compact and easily installed. —Jeffrey Mfg. Co., Columbia 16, Ohio. (70B)

Other Equipment Exhibited . . .

NEW MECHANICAL FINISH on plates of all-stainless heat exchanger offers lower surface roughness. Smooth polished corrugations inhibit formation of staining films, resist corrosion, and permit easier cleaning.–York Corp., York, Pa. (70C)

GRATE MAGNETS guard equipment and product from tramp iron and fine-iron contamination. Quickly-installed units handle free-flowing materials up to ½ in. dia., while grill protects Alnico V elements. Available in stainless steel in sizes from 2½x4 in. to 36½x36 in. Also shown was a sanitary magnetic trap that protects pump and product on liquid-handling lines. Top opens for easy cleaning. Sizes: ½ to 4 in. working pressures up to 150 psi.–Eriez Mfg. Co., Erie, Pa. (70D)

RESIN-IMPREGNATED FIBER FILTER has graded density for quality control of oils, coolants, gases, acids, and water. Provides increased capacity, high flow rate, and low pressure drop in removing particles down to 1 micron. Operates at pressures up to 70 psi.–Cuno Engineering Corp., Meridien, Conn. (70E)

PRESSURE-VESSEL DOORS cut opening and closing time to seconds. Units employ ratchet-operated locking ring that eliminates bolts, offers tight seal. Sizes: 3 to 12 ft. i.d., pressure to 300 psi.–Blaw Knox Co., Equipment Div., Pittsburgh, Pa. (70F)

FILTER-PRESS CLOSER minimizes downtime by converting mechanically operated presses to hydraulic closing. Easily installed unit permits accurate closing in a safe, one-man operation.–Biach Industries, 10 Indian Spring Rd., Cranford, N. J. (70G)

CENTRIFUGAL MIXER handles viscous liquids and slurries with three-fold action that prevents channeling. Shaft suspension does not require foot-bearings and drive is direct. Applications include homogenizing, emulsifying, and dispersing.–Neumann & Weaver, Inc., Fair Lawn, N. J. (70H)

SYNTHETIC FILTER FABRICS cut operating costs, improve filtration efficiency. Durable cloths have high strength, resistance to chemicals and abrasion, and controlled weave tightness for solids retention. Materials: Nylon, Dynel, Orlon, polyethylene, and Saran.–Filtration Engineers, Newark 4, N. J. (70I)

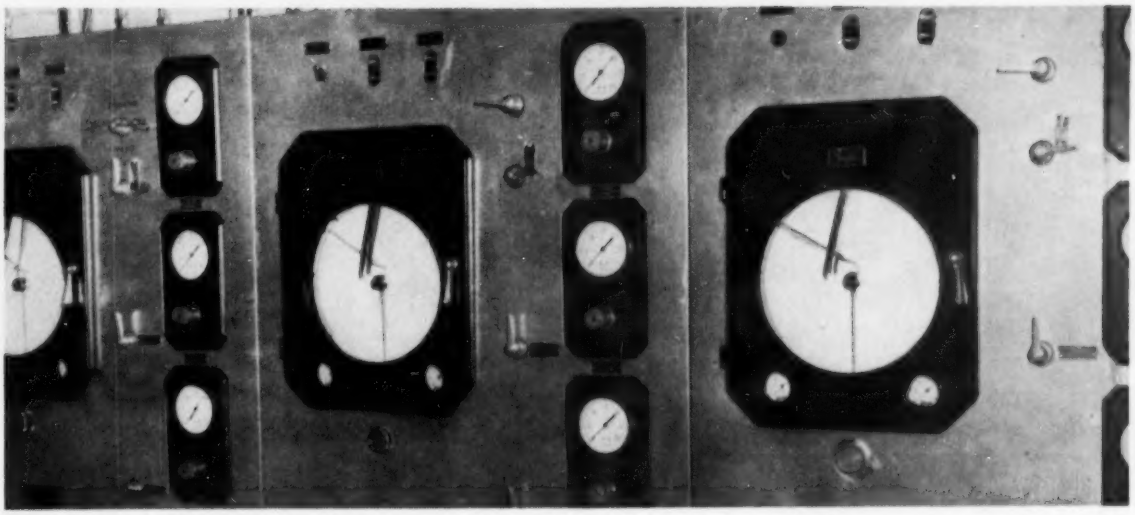
FLAT DISK-TYPE VALVE (3 or 4 way) easily adjusts for dual-speed control. Unit is lubricated with one grease fitting, while clamb ring fastens base to body. Uses "O" ring seals, thus no packing to adjust.–W. H. Nicholson & Co., Wilkes-Barre, Pa. (70J)

VIBRATING SCREEN is designed for dewatering and wet or dry-sizing with minimum downtime. Units operate at 1,200 to 1,500 rpm. for efficient eccentric action. Offered in steel and stainless alloys in sizes from 18x36 in. to 36x72 in., 1 and 2 deck.–Productive Equipment Corp., Chicago 12. (70K)

LINE-TYPE PURIFIERS of simplified design remove entrainment from steam or air to keep equipment clean and efficient.–V. D. Anderson Co., Cleveland 2. (70L)

LIGHT-WALL PIPING (Stainless, schedules 5 and 10) cuts costs, meets pressure safety requirements. It guards against product contamination regardless of wall thickness. Also offered is complete line of stainless fittings.–H. T. Potts Co., Philadelphia 34. (70M)

For More Details, Circle Key Numbers on Readers' Service Card



CROWNING Merkel's striking modernization program—which in actual fact was sparked by construction of a new truck dock—is this automatic control panel. It gives full regulation of smoking and steam-cooking cycles. The two-pen recorders note smoking and cooking temperatures, and the switch handles afford manual damper-regulation.

Revamped Plant Lines Up Output, Shipping Speed

When circumstances dictated a drastic layout revision, this Long Island meat packer turned the situation to his advantage. Result: Better handling, less manual labor, higher quality

ROBERT J. KELSEY
Assistant Editor, "Food Engineering"

Just a single urgent alteration at one point in your plant layout can throw things out of kilter all down the line.

But—such a turn of events can also prove to be the opportunity for modernizing your whole operation to gain new efficiency in product preparation, quality and shipping.

This was the case when Merkel Inc., Long Island meat packer, decided to build a covered, off-the-street parking area for receiving raw materials and loading its fleet of 40 wholesale delivery trucks.

The only space for this loading-unloading facility was at the starting end of existing processing lines. So Merkel executives had to rearrange their lines.

At the same time, they seized this chance to up-date equipment and thereby speed meat handling and cut manual labor.

As a result, hogs now loop from unloading to processing and back to loading by conveyor, chute, and lift-truck methods that are company-tailored to meet specific requirements. Operations of all departments have been carefully fitted into this minimum-handling scheme. And all are equipped with modern machines that promote high-speed production, yet fit limited space requirements.

With such changes and careful tining of unit operations, fresh meat and processed products arrive on the shipping floor at peak quality—a prime advantage in the competitive market.

But let's move in for a close look at these new features—

The routine gets rolling at midnight, when carcasses arrive from the slaughter house in Manhattan (hogs being killed during the day, then hung in coolers to chill). Low temperature is maintained throughout movement by carrying meat in trucks equipped with mechanical (gasoline powered) refrigerating units.

Loads are carefully scheduled all night long to maintain a continuous flow to the production line.

One corner of the loading area is used for receiving carcasses. Trucks back up to an over-head chain conveyor, where carcasses are hooked on, then whisked up one floor to the cutting line.

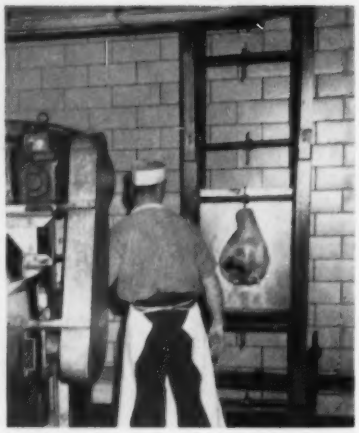
Every effort is made to process directly from trucks and prevent extra handling. However, a 200-hog cold storage room is used to take up any surplus and to afford a supply for the line during times trucks are being changed.

Conveyor runs at constant speed and supplies 200 hogs per hour to the cutting line. By careful job analysis, the company has achieved a cutting rate of 8 hogs per man-hour. And, a normal run sees 1,300 animals pass over the belt in the 6¼-hr. working period between midnight and 7 A.M. (there is a 45-min. time-out for lunch).

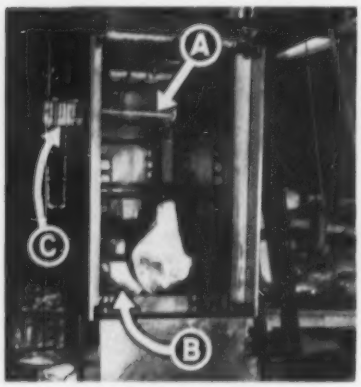
Unique feature of this line is its

Meat-Handling Methods That Cut Hand Labor

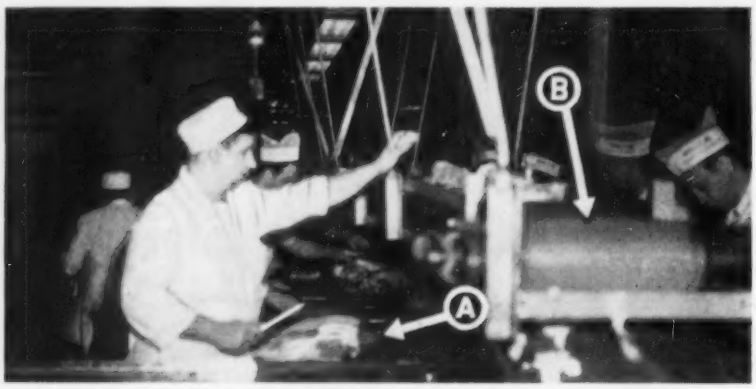
HAMS are salted down in stainless steel vats that meet highest sanitation standards. Note C-beam legs on tanks. These permit handling and stacking by fork truck. Rounded corners, inside tanks, ease cleaning.



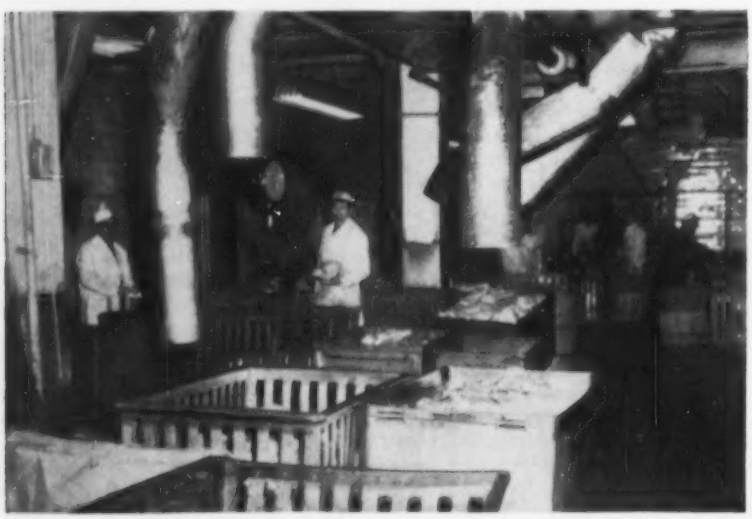
UNIQUE ELEVATOR moves cured hams to boning line. Operator sticks meat on "L" hooks on flights.



AT 2ND FLOOR, rising hams press against bar (A) and are detached. Meat chutes to boning line (as at B). Counter (C) advances each time bar is touched, thus records production.



BONERS are supplied with hams by linked belt (A), which also discharges finished product. Wire-mesh belt (B) carries scraps away from line, thus eliminates old-style buckets and cans. Here, waste fat moves atop carrier (toward camera), as lower, return level carries bones toward discharge end of line. Compact set-up has greatly increased boning speed.



SHIPPING ROOM view shows chute system that carries meat away from cutting line (on floor above). Worker (center) sorts fresh hams by weight into different wheeled bins for immediate truck loading.

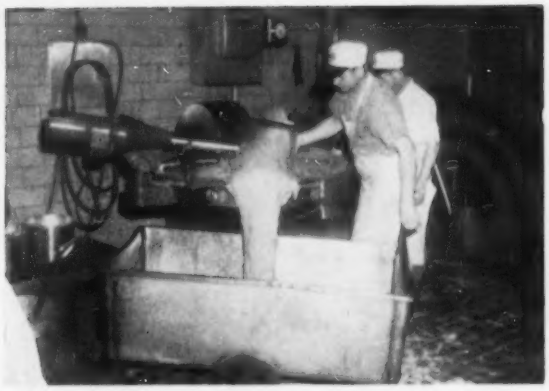
location—on the second floor, directly over shipping room. Thus, as men remove cuts and finish trimming them, they need merely drop meat into chutes, located beside their stations. Fresh hams, loins, and spare ribs slip quickly to wheeled bins on the shipping floor, where they are graded and wrapped (if necessary) for direct truck loading.

This system offers great speed and contrasts sharply with old-style procedure, where cuts were loaded into hand trucks on cutting floor, then transferred by elevator to the dock.

The ham-boning line is in the same room as the cutting line (on second floor). And it, too, uses a novel conveying method (developed by Merkel) to eliminate hand trucks.

A twin-chain vertical elevator rises two floors from the basement curing area. Hams are loaded on L-shaped hooks, and as they reach the elevator

PACKAGING operations are represented by luncheon meat department. Here, slicing machine (as at A) cuts meat. Stacked product is then fed into rotary unit (B) that draws vacuum and seals packages.



NEW CUTTER (Seydelmann) speeds preparation of baloney, liverwurst, pork sausage, and frank meats. High-velocity knives blend 350-lb. loads of chunk meat in 2-11 min. A 700-lb unit is now being readied.

top, they press against a bar that detaches them from the carrier. Meat falls on a chute and slides to the boning table. The bar also serves to turn a counter, and thus keep track of delivered quantity.

The elevator has a variable-speed drive. It is used to adjust ham rate to the number of men working on the line, compensate for the size of hams being processed, and allow for type and number of cutting and trimming steps necessary in preparing the product.

Standard number of men on this operation is 24. Boned meat is moved manually to pressing and stuffing operations. Finished product is transferred to a flighted, wire-mesh escalator that carries hams up one floor to four, 6-cage Julian smokehouses. Boned hams can also be slid down a short chute to a canning line, which branches from the foot of the boning table.

A link-conveyor runs down the center of the table to carry meat. A wire-mesh belt, positioned above it, moves fat scraps in one direction and bones on the under (return) side. Thus, individual fat-and-bone cans are eliminated, and only two carts (one at each end of the boning table) are needed to catch waste.

Conveyorizing of cutting and boning tables has eliminated 18 to 20 hand trucks formerly used to transfer products and by-products to and from lines. And this has enabled fitting of both operations into one room.

Decentralized Smoke Houses

In refitting different departments to enable a smoother production flow, it was found impossible to concentrate smokehouses in one area. So, these units were each placed near the separated ham, bacon, frank, and sausage departments. These locations cut haulage.

To cut costs, each group of houses is supplied with smoke, by means of a main header, from one large generator (Mepaco), located as near to the group as possible for maximum efficiency. To eliminate leakage and waste, separate smokehouses are positively cut off from the header, when not in use, by water-sealed valves (designed by Atmos Corp.).

Bacon, bone-in-hams, and picnics travel to three Albright-Nell revolving smokehouses, and three new 6-cage Atmos houses process bologna and frankfurters. Last-named units have single control panel (see photo) that contains switches for changing dampers, fans, valves, and controllers to regulate smoking and cooking cycles.

Concentrated Packaging

In contrast, product packaging is grouped in three consecutive departments on the ground floor to permit fast lift-truck movement of finished goods to the shipping room.

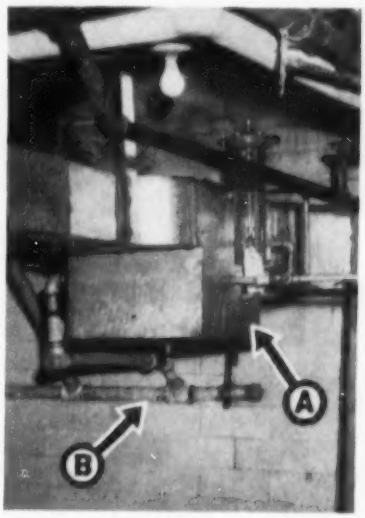
Bacon speeds over an Anco slicing line to a Globe overwrapper. Skinless franks are stripped (Linker machine) and then pass over a Corley-Miller packing line (1-lb. packages). Bulk franks are peeled and boxed by hand on a company-designed table.

Three U. S. slicers cut luncheon meat and supply one 8-head, rotary Flex-Vac vacuum packager (Standard Packaging Corp.).

Operation of all departments is geared to "turn-over" products every 48 hr. Thus the trucks, which load between 2 A.M. and 10 A.M., draw stock packed the same night (fresh meats) and previous day (processed meats).

To meet this schedule, department

(Turn to page 154)

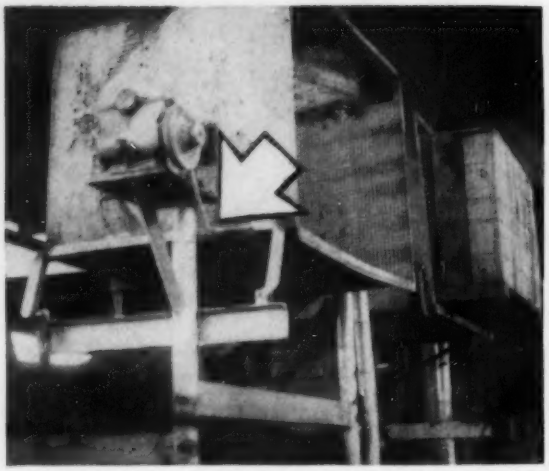


SMOKE CONTROL valve shuts off unused smokehouses. Inside baffles direct flow through tank (A). When this is filled with water, through supply line (B), positive seal is insured.

Operations Timetabled

Hogs leave slaughter house	11 P.M.
Fresh meat cutting	12 M.-7 A.M.
Route-truck loading	2 A.M.-10 A.M.
Ham-boning	6 A.M.-3 P.M.
Luncheon meat packaging	6 A.M.-3 P.M.
Bacon curing	2 A.M.-11 A.M.
Ham curing	6:30 A.M.-3:30 P.M.
Sausage making	6:45 A.M.-3:45 P.M.
Bacon slicing, packaging	7 A.M.-4 P.M.
Skinless frank packaging	7 A.M.-4 P.M.
Smoking and cooking	Around clock

1 **PALLET BOXES** are inexpensive, easily handled by fork trucks, take less labor and space than baskets.



2 **WHEN** handle (arrow) is turned, box moves counter-clockwise dumping vegetables in trough below.

Engineering Ingenuity Creates 7 Work Savers

Low-Cost Pallet Boxes • Box Dumpers • Automatic Destoners • Sweet Potato Snippers • Drum Dollies • Broccoli Distributors • Proportioning Feeder for Frozen Foods—All help break production bottlenecks

ARTHUR V. GEMMILL
Senior Associate Editor, "Food Engineering"

How shop-engineered equipment can aid quality control, solve pressing problems, and save labor is dramatically illustrated at John H. Dulany & Son, Inc.

In the company's Fruitland, Md., canning plant, for example, a number of innovations are stepping up operations. Some of these are—

1—Low-Cost Pallet Boxes

Built to company specifications at a cost of less than $10, these boxes hold 25 bushels of beans, potatoes, spinach, etc.

They are hauled on flat-bed trucks from farms where the vegetables are transferred from picking baskets. This transfer provides an excellent opportunity for observing quality of the vegetables, as well as the presence of stones and other extraneous materials.

At the plant, the boxes are removed by fork-lift trucks and stacked four or five high until the vegetables are needed for processing. And in case it is desirable to hold products overnight, the boxes may be stacked in the plant's large refrigerated room.

When vegetables were received in baskets, it took 15-25 men to remove them from trucks, take off the lids, and assemble them in bunches, and to dump the baskets as required. Spillage was also an important factor. Now, the entire operation is performed with two fork trucks.

2—Box Dumpers

For unloading the pallet boxes onto conveyors that feed processing lines, special dumpers were devised. These comprise metal boxes approximately the size of pallet boxes, open at front to receive latter, and also at the top.

Each metal box is mounted beside and above the conveyor belt in such a manner that it can be turned through 90 deg. by means of a manually operated gear box.

Filled pallet box is raised by a fork truck and set in the dumper. Then dumper is turned so top of box is in vertical position, permitting vegetables to fall on belt below.

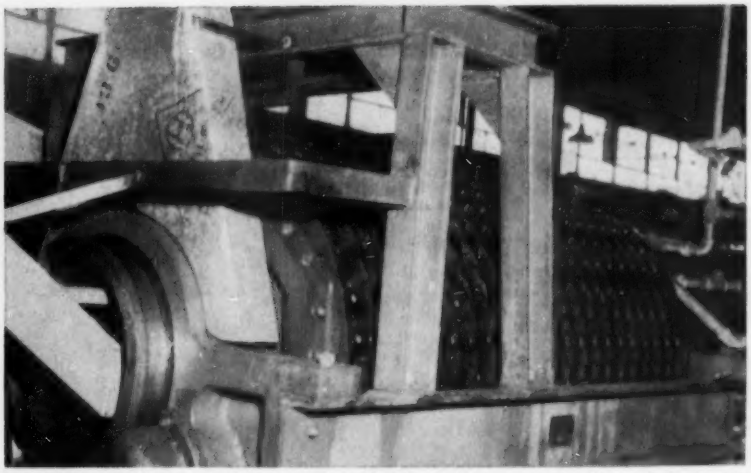
Two dumpers are mounted at each conveyor, thus enabling a continuous feed of products to the processing operation.

3—Automatic Destoner

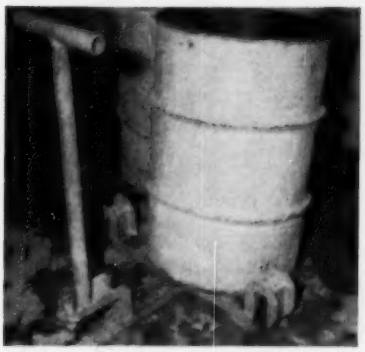
Simple shop-made units are employed to remove stones from vegetables on the way to processing. Each is comprised of a sloping metal trough in which are welded baffles that divide it into a number of compartments. Water enters the highest point of trough, being fed by a shop-made pump designed especially to eliminate turbulence.

Vegetables fall from the belt conveyor on which they are received, into the destoner and slowly float from one compartment to another, finally discharging to a wire belt where they are de-watered. Heavier objects settle to the bottoms of the compartments

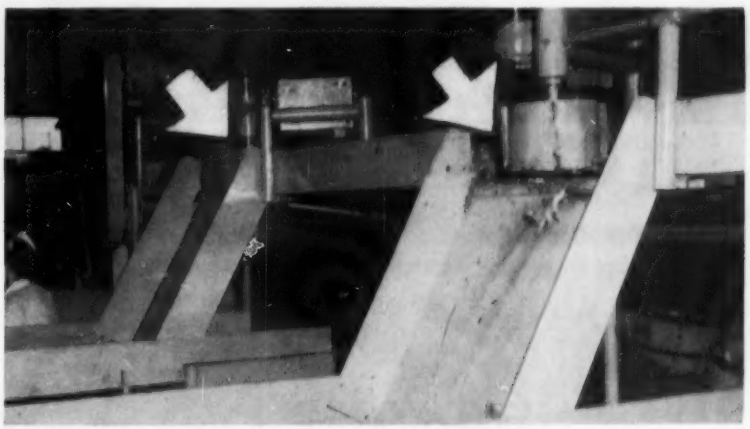
3 BAFFLES form compartments in which stones settle out.



4 ENDS of sweet potatoes are snipped when they protrude through holes in rotating drum. Stationary knife (not shown) does cutting.



5 FILLED drums are easily moved by one man with dolly made from three rubber-tired wheels, channel iron and pipe. Swiveled front wheel enables operator to turn dolly in small space.



6 BROCCOLI is equally distributed to several inspection belts (foreground) by rubber baffles attached to revolving drums (arrows).

where they are held as the vegetables move on to processing.

Water passes through the wire belt into a sump from which it is picked up by the pump and returned to the destoner.

4—Sweet Potato Snipper

In preparing sweet potatoes for canning it is necessary to remove the ends and, unlike green beans, no equipment was available to do the job mechanically. Therefore, a snipper was designed and built.

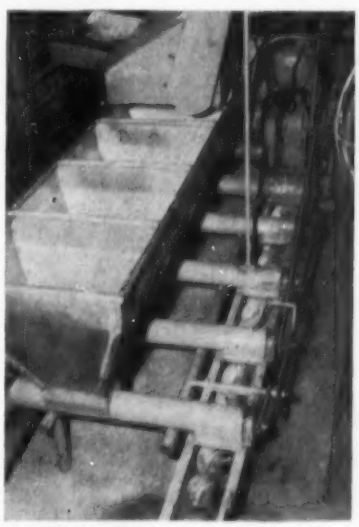
Unit comprises a revolving, heavy metal cylinder with a large number of holes tapered to the shape of sweet potatoes. On the inside of the cylinder is a spiral that slowly moves the tubers from feed to discharge end. In so doing, it causes them to fall into the tapered pockets. The ends that extend beyond the wall of the cylinder are cut off by a stationary knife. Several different units were built with holes to accommodate different size sweets.

5—Drum Dolly

One of the outstanding quality control features of the Dulany operation is the method of handling lima beans and peas for canning. Growing areas for these are frequently a considerable distance from the Fruitland plant. So, a cooling station was established in this area. Here, vegetables are received from the vining stations by a truck that makes frequent pickups. Upon arrival they are quality graded, cooled, filled into 55-gal. steel drums, iced and trucked to Fruitland.

Here, the filled drums are moved by simple 3-wheel dollies fabricated in the company shop. Dollies are made with small, rubber-tired wheels, iron channels and piping (see photo).

(Turn to page 173)



7 UNIFORMITY of mixed frozen vegetables is insured by proportioning feeder.

ACCUMULATOR for three cyclone separators collects dry flavor emulsion dust and fines for reprocessing.

SHARP "ROOFS" keep product off ducts in dryer. Vertical duct discharges hot air under atomizer.

Advances in Spray Drying Improve Flavor Quality

First emulsified then quick-dried, flavors retain potency and have greatly extended shelf life. Suitable for dry mixes, drink bases, and similar products

FE STAFF

Several achievements were chalked up with the introduction of continuous, instrument-controlled, spray drying at the newly erected plant of Norda, Inc., Boonton, N. J. Among them are:

- **Assurance of uniform dry-flavor quality.**
- **Minimum flavor loss throughout greatly extended shelf and storage life.**
- **Reduced costs through mass-production methods.**

This development invites many new applications of dry powder flavors in the manufacture of prepared dry foods. And it may well advance the unit operation of moisture removal in food processing.

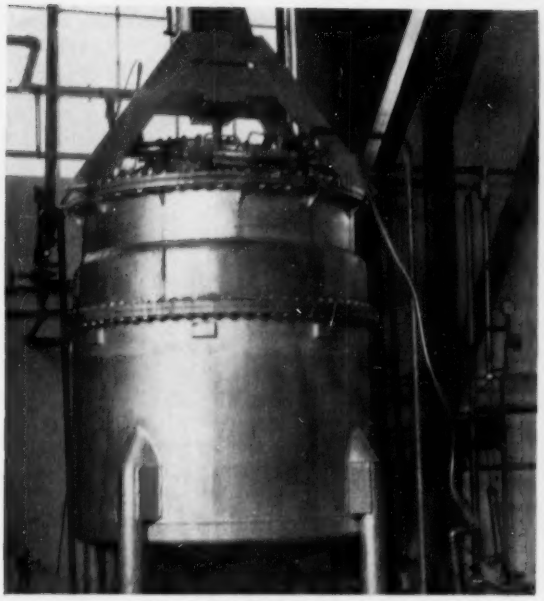
Here in sequence are highlights of Norda's dry-flavor production:

In preparation for spray drying, the liquid flavor is emulsified with gum arabic (approximately 20% by weight) to make a solution of approximately 35% total solids. This solution, held in a steam-jacketed stainless steel vessel equipped with a mechanical agitator, is pumped in controlled amount to the spray dryer's centrifugel atomizer.

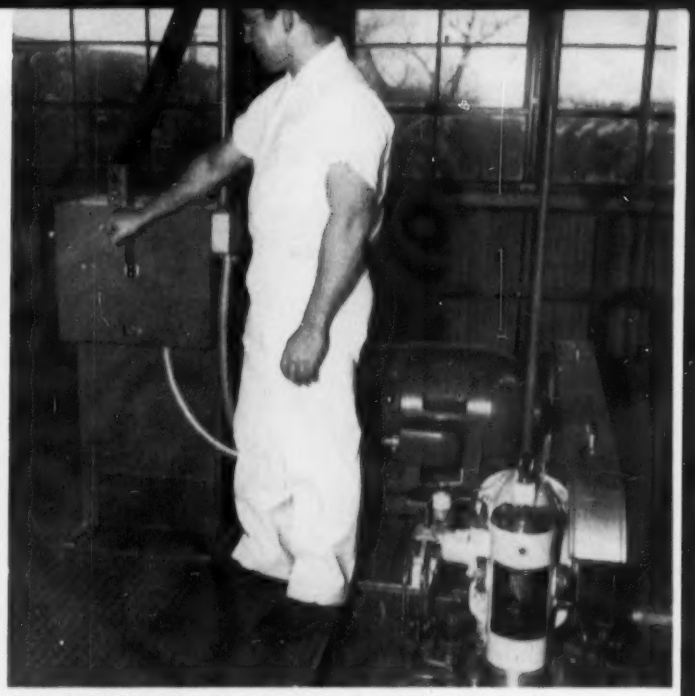
Extending down from the 18-ft.-dia. head of the dryer is an essential element of the process, a Nerco Niro centrifugal atomizer of Danish design. This atomizer is driven at 12,000 rpm. by a 15-hp. motor (located on top of the unit), through step-up gearing. Filtered air—heated to approximately 450 F. at a rate of 5,000 cfm.—is released in the dryer directly below the spray. And the hot blast passes through louvres which whirl it in the same direction that the centrifuge is rotating.

From holding tank to the dryer's atomizer, the temperature of the liquid flavor emulsion is maintained in jacketed stainless steel tubing. So when the emulsion emerges from the atomizer, the resultant fog-like mist is split-second dried to particles of between 10- and 250-microns size. And each particle has a high ratio of sealed surface area to volume. The temperature drop of the heated air resulting from

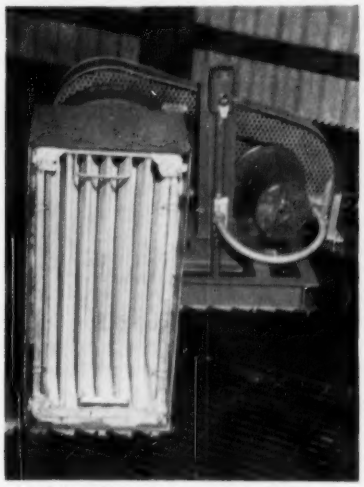
YOU'LL FIND a graphic 4-page Fold-out Flowsheet of Norda's advanced production lines on pages 102-105.



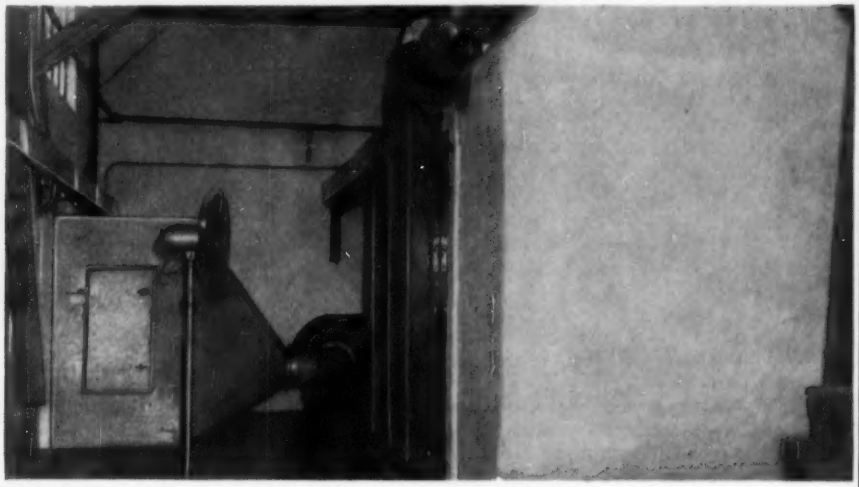
JACKETED holding tank where emulsified flavors are agitated at controlled temperature.



CENTRIFUGAL atomizer in dryer dome is driven by 15-h.p. motor mounted on top of dryer.



AIR FILTER and blower system provide clean air for cooling outside sheathing of hot-air duct.



BLOWER (center) draws air into 8-ply, paper type filter (left) then through 600-kw. heater (right) to provide 5000 cfm. of 450-deg. F. air, for drying emulsified centrifuge atomized flavors.

evaporation is from 450 deg. to 210-220 deg.

The exhaust duct located nearer the bottom of the dryer-cone delivers air and fines to three cyclone collectors. And the product dust collected in these is reprocessed.

Finished product discharges continuously from the cone bottom of the dryer onto a closed vibrating conveyor which empties into a spout feeding a gyratory sifter. Then the flavor goes into fiber drums.

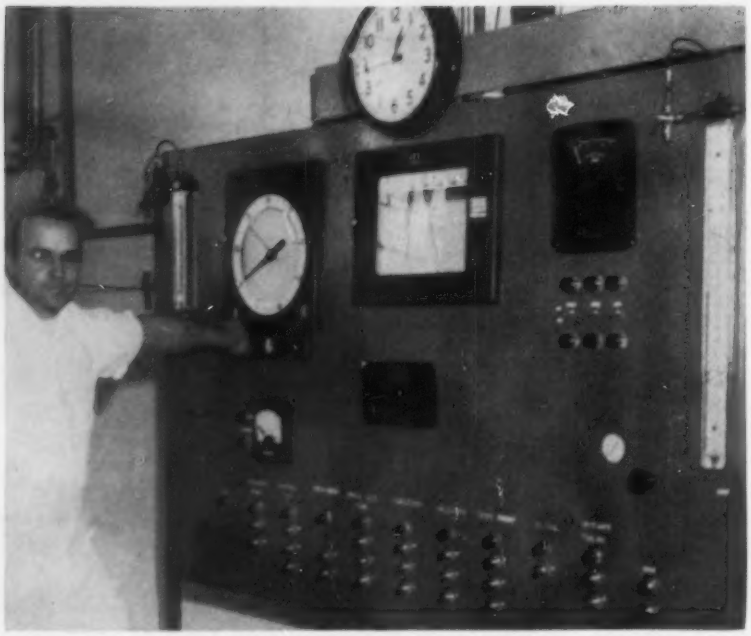
Particle size of finished flavors (which depends on use for which product is intended) ranges generally between 75 and 250 microns, averaging 150 microns. Oversize particles, almost negligible in quantity, are separated in the gyratory sifter and returned with the fines for reprocessing.

Ticklish Problem Licked

Flavor emulsions are delivered to the atomizer at a temperature between 120 and 150 deg., depending to some extent on flavor constituents and their volatilizing temperatures. Herein lies one of the technical problems of spray-drying flavors—even when in an emulsified colloidal state.

A single flavor may be compounded of as many as 20 or 30 alcohols, ethers, aldehydes, ketones, etc. Boiling points of the various constituents may range from 100-120 deg. to 300-350 deg. And though total evaporation loss of flavor constituents during processing has proved to be less than 5%, the loss of some of the low-boiling ingredients may be considerably higher.

Laboratory research and pilot-plant testing are therefore requisites for initial compounding of a flavor. Such study is necessary if the final dry flavor powder is to contain the flavor ingredients in exactly the proportion re-



INSTRUMENTS record temperatures of emulsified flavor in holding tank and at centrifugal atomizer, also of air at dryer intake and outlet.

quired—regardless of the evaporation rate of any and all of the flavoring constituents.

Although air at 450 deg. blasts the sprayed flavor emulsion, the evaporation rate (800 lb. of water per hour) is controlled to prevent product damage through over-heating. Even with the exit temperature of the exhaust air at 210-220 deg., the product is rarely discharged from the dryer at a temperature above 150-160 deg. And then it is cooled rapidly to approximately 90 deg. as soon as it is discharged.

This product cooling is accomplished as the dry powder travels along the vibrating conveyor between the dryer exit and the gyratory sifter. Air at room temperature is drawn into the discharge end of the closed vibrating conveyor by slight negative pressure, and it travels counter-current to the product. Vacuum in the dryer is maintained by the differential between the volume of the hot-air input blower and that of the exhaust blower. Located after the cyclone, the latter discharges to atmosphere.

For Protection of Product

At many steps in the process, precautions are taken to control quality and prevent contamination of the product. After each run, the system is washed. Water for this washdown is pumped through a plate-and-paper type filter before entering the system via the jacketed holding tank.

Several devices are engineered into the spray dryer to insure that the product never makes contact with any overheated surface inside the unit. Entering near the bottom of the dryer, the hot-air duct extends up through the unit, to within approximately one foot of the atomizer. But this duct is covered by a layer of insulation and is surrounded by an air chamber. Filtered air at plant temperature is blown through this chamber to exhaust at the duct terminal with the heated air.

To prevent any product from settling on horizontal sections of either the intake or exit duct, both are covered by sharp-gabled stainless steel "roofs."

One other precaution against product damage bears mention. Before the 5,000-cfm. air-blast is heated, it passes through an 8-ply American Air Filter.

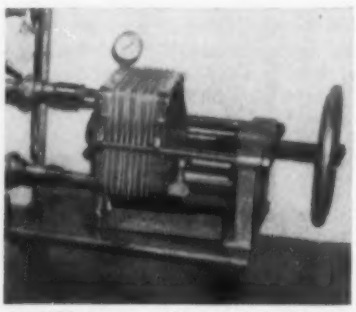


PLATE paper filter for purifying wash water is essential sanitary measure for product protection.

The drying air is electrically heated by a three-section unit with capacities of 372, 192, and 86 kw., respectively. Three transformers totaling 650 kw. are installed to handle the heating and power requirements, stepping the power from 4,100 to 440 volts.

Heated air entering the dryer is maintained at the required temperature (± a few degrees) by thermocouples in the duct near its entrance to the dryer. These turn the current on and off, first for the 86-kw. heater, then for the others if necessary.

Though slightly more costly than other heat sources, electric heaters nevertheless have advantages. An important one is cleanliness. Then, too, if steam were employed, a superheater occupying greater space would be required, and temperature control might not be as accurate.

However, preliminary heating of air by saturated steam, followed by electric heating, might reduce costs and still permit accurate control at the high temperatures required.

Although it is possible to vary the rpm. of the atomizer, its operation is a constant for each drying cycle. The remaining important variable influencing dryer performance is rate of fluid feed, and this is regulated to a near constant by instrumentation.

Located in the exhaust duct where the heated air leaves the dryer is a temperature-sensing element for a controller that actuates an air-operated valve in the flavor-emulsion line. This valve reduces, or increases, flow of liquid to the atomizer. Since exit temperature of the constant flow of air leaving the dryer is determined by the rate of evaporation of the flavor liquid, this control system is important to dryer efficiency and product quality.

Other Instrumentation

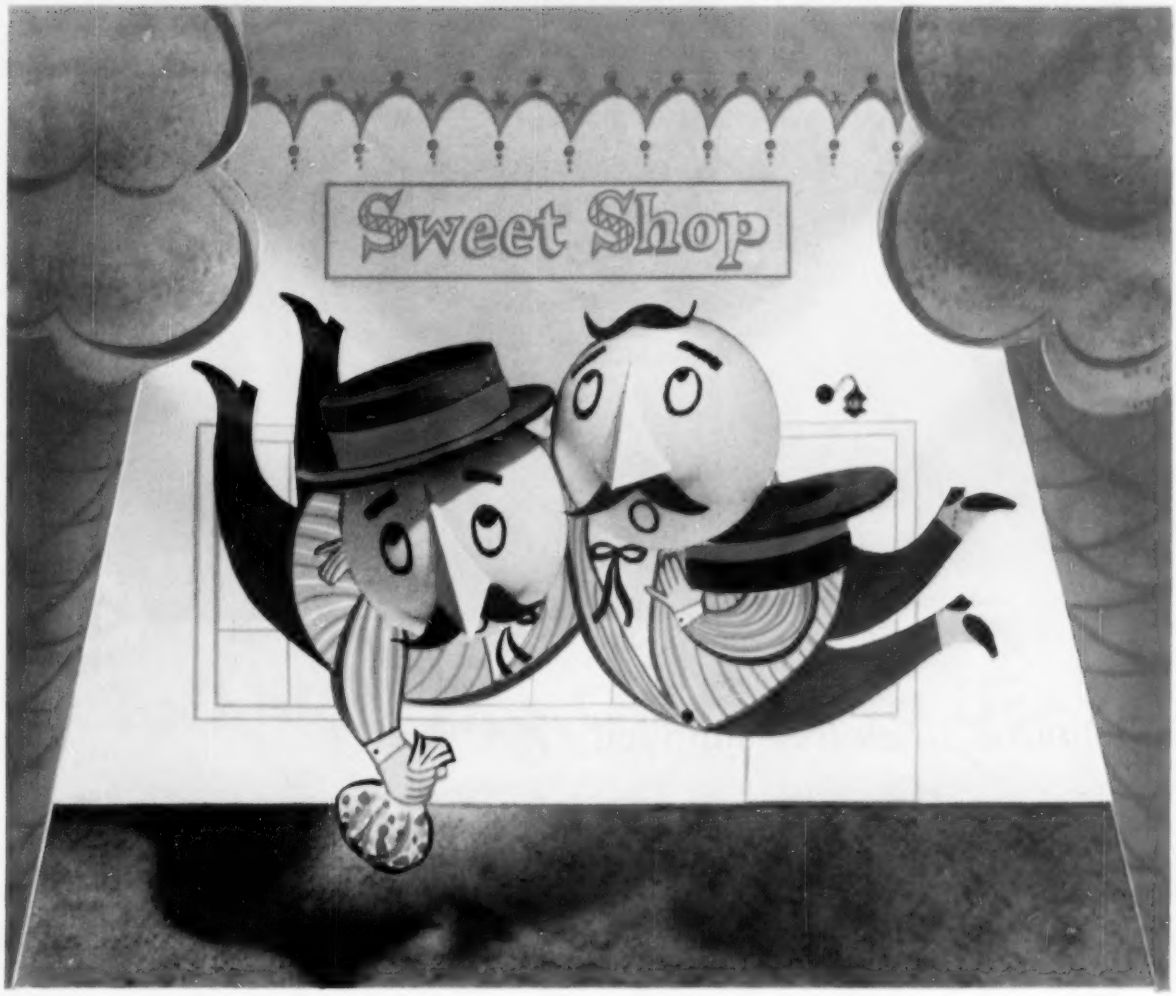
Manual operations have been minimized by automatic controls. And indicating and recording instruments permit close process supervision. Rate of flow of flavor fluid, pressure in the dryer and in the cyclones, and duct temperature of the heated air are recorded. One instrument traces on a single chart the inlet and outlet air temperatures, the temperature of the emulsion in the feed tank, and the feed-line temperature at the entrance to the atomizer.

Capacity is High

Flavor emulsion, with its 35% solids content, is fed to the atomizer at the rate of 1,265 lb. per hr. The dryer evaporates 800 lb. of water per hr. to recover 375 lb. per hr. of dried flavor

(*Turn to page 155*)

DOW



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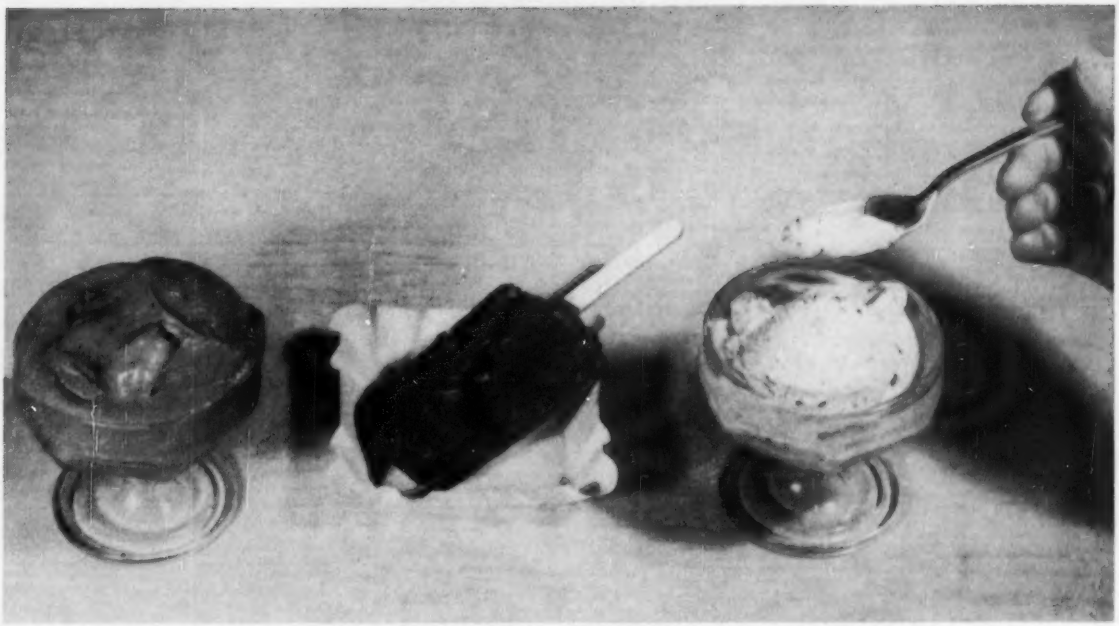

Make better chocolate and chocolate chip ice creams or "pops" by following these . . .

Technical Tips On How to Use Chocolate Products *in Ice Cream*

Expert gives you pointers on product formulation. Details working facts on stabilizers and emulsifiers. Presents processing data

SECOND OF TWO SPECIAL ARTICLES*

FRANCIS X. KOBE
Technical Director, Rockwood & Co., Brooklyn, N. Y.

Manufacture of high quality chocolate ice cream poses special problems—not found in production of the plain vanilla product.

This stems from the fact that the two flavoring ingredients—chocolate liquor and cocoa—have entirely different properties. And since these flavors are used separately and together, to obtain an infinite variety of color shades and tastes, it is necessary to understand their nature thoroughly to get best formulation and stabilization.

So let's get the basic facts on each of these two ingredients straight, and then see how they fit into the overall product picture.

Chocolate liquor has a cocoa butter content ranging from 50 to 55%. Cocoas contain from 10 to 25% cocoa butter. And blends of these two vary from 25 to 40% total fat.

Any combination of the two flavors may be used legally, and product can still be labelled "chocolate ice cream". For according to FDA, "The Administration will not institute action against *chocolate ice cream* when cocoa is substituted in whole or in part for chocolate".[1]

Flavor and color of chocolate is primarily due to the cocoa matter—therefore, cocoas with their low fat content are a more concentrated source of flavor for ice cream than chocolate liquor.

And when comparing chocolate liquor with cocoa, it should be noted that 2.2 times as much liquor is required to achieve the same flavor level provided by only 1 unit of fat-free cocoa.

Then why use chocolate liquor at all? Because, this flavor source is not subjected to the heat and pressure of the cocoa-pressing operation. And thus, it retains certain delicate, aromatic flavors that give it a richness highly desirable in good ice cream.

The amount of chocolate liquor or cocoa used in the product is far from being standard and will depend on local consumer tastes. But a good flavor guide (in percent of total formula) is as follows:

Mild	2.5-3.0%
Medium	3.0-3.5%
Strong	3.5-4.0%

These values may vary depending

*First article is "Technical Tips On How to Use Chocolate Products *in Milk*", FE Jan., p. 64.

on whether natural or alkalized cocoas are used.

In preparing any formula, it should be remembered that cocoa solids have a somewhat bitter flavor. This can be subdued by addition of 2-3% more sugar than is used in a plain ice cream mix.

A good chocolate mix contains 16-17% sugar, 10-12% butterfat, 10-11% solids-not-fat, and a total solids range of 40-42% (see table).

Large manufacturers prefer such a mix to a chocolate syrup, because it contains all the milk ingredients, flavor, sugar, stabilizer, and salt—and can be easily added and mixed in the pasteurizing vat.

Facts on Butter Fat

Dairy products provide the necessary amount of fat and solids-not-fat. They may take the form of whole and skim milks (evaporated, condensed or in powder form), cream, and butter. Whole milk is used mostly to standardize high-test cream to the desired butterfat percentage.

Minimum butterfat level must conform to legal requirements. And cocoa butter cannot be included in this percentage to satisfy requirements of the law.

Processors now regard use of condensed and sweetened milk products as essential in making ice cream, for each furnishes a large amount of solids. This increases product palatability, gives a smooth body, and improves texture.

Whole and skim milk powders can also be manipulated to give proper proportions of fat and serum solids.

How to Stabilize Product

For a smooth product, it is necessary to use a stabilizer. It serves to retard formation of ice crystals, reduce graininess, regulate viscosity, and give stability to the finished ice cream product.

In chocolate ice cream, stabilizer content is generally reduced 20-25% below that of plain mixes.[3] This is because chocolate mix has higher total solids and gains some stabilizing effect from starchy materials naturally present in cocoa.

Stabilizers now in use include gelatin, gums, and alginates. Balancing salts, such as sodium citrate, phosphate, and hexametaphosphate, may be added if there is no question of their legality.

Emulsifiers are sometimes desirable in chocolate mixes—though they are not always necessary. They tend to prevent or retard formation of fat aggregates, and are particularly helpful where source of butterfat is a frozen dairy product.

Some emulsifiers in use are lecithin, egg yolk, glyceryl monostearate, and other sorbitan or synthetic surface-active derivatives.

Viscosity of the product is affected by the type of chocolate or cocoa used, and also by the stabilizer. For example, Dutch process cocoa from different sources can react differently, even when all other factors are kept the same.[2]

However, it is said that there are fewer viscosity problems with these alkalized cocoas than with the natural types.[4] This may stem from the lower soluble ash and higher acidity content of the natural product, as well as the un-modified character of natural cocoa tannins.

End result is that processors must take great care when selecting a stabilizer, and choose one which is compatible with the particular chocolate being used in the product.

Processing Details

Except for homogenization, procedure for processing a chocolate mix is similar to that used for a vanilla ice cream.

Ingredients are added to mixing vat and pasteurized at 160 F. for 30 min. Two-stage homogenization is generally used—1,500 lb. pressure in the first stage and 500 lb. in the second. By observing quality and absence of churning in the freezer, it may be possible to reduce the first stage pressure. Mix is finally cooled to 30-40 F.

One recent installation uses a continuous process for ice cream mix. Here, short-time pasteurization is conducted between 200 and 250 F. It is followed by filtering, homogenizing, and finally surface cooling.

An advantage in this system is that it can be easily cleaned by recirculation.[5]

Further Chocolate Uses

Two other ice cream products are made with cocoa and chocolate. These are chocolate covered "pops", made with pail coatings, and chocolate chip ice cream. To fully cover either of these products is beyond the scope of this article.

But briefly, pail coatings (so-called because they were originally sold largely in pails) are a mixture of cocoa and/or chocolate liquor, sugar, vegetable fats other than cocoa butter, milk solids, emulsifiers, and flavor.

Fat content is approximately 60% and consists largely of coconut oil (melting point, 76 F.). This fat content can be modified, however, to raise the melting point or reduce brittleness.

Because of the variety of equipment and operating conditions in plants using these types of coatings, trial product runs are essential. These will iron out technical problems before the start of full production.

Chocolate chip ice cream contains pieces of chocolate. For this product, chocolate may be obtained in slab chocolate coating, flakes, bits, or even in canned chip products.

There are a variety of methods for preparing the chip ice cream. Probably the most common is to place melted chocolate (100-115 F.) in a fruit feeder, from which it passes by means of a star-wheel into the ice cream as product emerges from continuous freezer.

Ribbon pumps are also used to feed thin streams of chocolate either into a feeder or directly into cold mix lines.

3 Commercial Chocolate Ice Cream Mix Formulas*

	I	II	III
Cocoa	3.0%	.....	1.5%
Chocolate liquor	.....	5.0	2.5
Butterfat	10.0	9.5	10.0
Milk solids-not-fat	10.0	10.0	10.0
Sugar	17.0	17.0	17.0
Stabilizer	0.25	0.25	0.25
Total solids	40.25%	41.75%	41.25%

Additional flavors and salt may be added. Balance of formulas (which total 100%) is water contained in dairy ingredients.

* E. L. Fouts, "Facts By Fouts", *Southern Dairy Products Journal*. 168, Oct., 1955.

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2. C. D. Dahle, "Controlling Viscosity in Chocolate Ice Cream Mixes", *Proceedings*, International Assn. of Ice Cream Mfrs., 2, 5, 1948.
3. H. H. Sommer, *Theory and Practice of Ice Cream Making*, 5th Edition, 1946.
4. G. D. Sperry, "Algin Stabilizers in Chocolate Mixes", *Ice Cream Review*, 146, October, 1953.
5. R. O. Tardiff, "High-Short Pasteurization Ups Capacity, Cuts Labor", Food Engineering, March '55, p. 63.

1906

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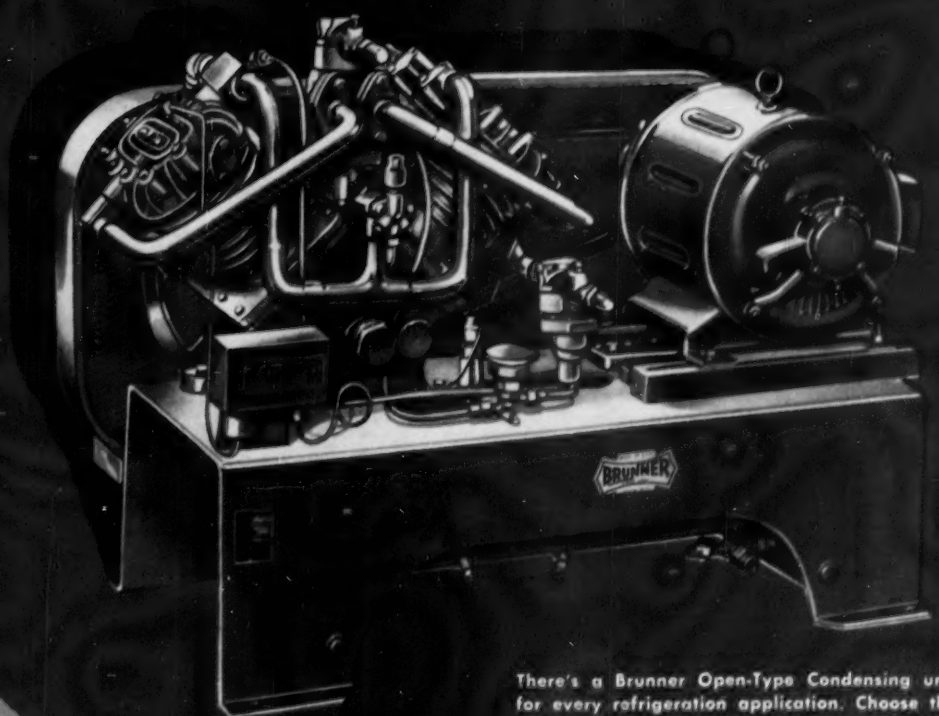


There's a Brunner Open-Type Condensing unit for every refrigeration application. Choose the *right* unit for the *right* job. Sizes range from ¼ H.P. through 100 H.P.

A TWIST OF THE VALVE readies this lift truck for 12 to 14 hr. of operation—without refueling. Pressurized liquid petroleum gas (LPG) feeds direct from compact, 8-gal. tank to carburetor to turn the trick. Empty cylinders are changed in less than a minute by unsnapping quick-disconnect hose coupling and two tank straps.

For Clean Air and Economy, Gerber

Fuels Trucks With LPG

Liquid petroleum gas permits fork-truck operation in process areas —with no employee discomfort or danger of product contamination. Rigid maintenance program discloses cost savings for unique fueling system

TO keep pace with fast-moving baby food lines, Gerber Products Co., Rochester, N. Y., makes wide use of fork trucks to handle both raw products and finished goods.

With a constant stream of these gas-powered vehicles passing in and around processing areas, the company is naturally concerned about exhaust fumes--both for their effect on employees and because they can contaminate sensitive food products.

To beat this problem, Gerber decided to try liquid petroleum gas (LPG) fuel systems on its lift trucks. So they purchased eight new machines fitted for this purpose by Clark Equipment Co.

After a test period, the unique method was pronounced a complete success. All irritating smoke and fumes were eliminated. Whatever slight vapors arise from LPG-equipped trucks are both colorless and odorless, and raise no problems to plague sanitation men or upset plant workers.

The company now has converted its older gas-powered vehicles to the new system at a cost of only $175 per machine (figure includes labor).

Gerber also has discovered bonus savings through lower operating costs with the new fuel—fully 15% of its former lift-truck maintenance budget.

But, before taking a look at the servicing program, a quick rundown on the LPG system is in order.

How LPG Works

Liquid petroleum gas is a mixture of butane and propane. The fuel is contained in a strong but compact tank, and is kept in the liquid state by pressure.

When truck engine is started, liquid fuel flows to a special regulator that allows it to expand into a gas.

SPECIAL DEVICE (attached to scale beam) insures accurate tank charging. Mechanism cuts off gas flow when cylinder reaches 33½ lb. net.

Pressure forces gas into the cylinders.

To govern this action, a solenoid valve is connected with the engine starter switch (see diagram). This valve closes when ignition key is turned off, and thus serves to positively stop fuel flow when engine is stopped.

As an added safety precaution, a vacuum switch has been placed between ignition and solenoid. This device prevents fuel from entering cylinders before the engine turns over.

Two most desirable features of this fuel are: It burns clean without giving off visible or irritating vapors; and it leaves no unburned carbon, lead compound, or varnish deposits in the engine.

Also, because this fuel enters the engine as a dry gas, there is no liquid to dilute the cylinder lubricant. Results: Less wear on cylinder walls and bearings, and longer life for the oil.

It is claimed, too, that because LPG automatically vaporizes before it reaches the engine, the machine is easy to start even in very cold weather. This feature also permits use of a cold intake manifold, since fuel does not require heat to vaporize.

Fork-truck engines are modified to operate at a higher compression ratio (8 to1). This properly utilizes LPG's high octane rating and thus gives more efficiency, fuel economy, and engine power.

To further increase engine life, stellite-faced valves and seats are installed, and positive valve rotators are provided. These are desirable, says Clark, because LPG has a high flame temperature and tends to burn conventional valves.

Refueling is a simple matter and takes but a minute. Gerber maintains a bulk storage tank and truck-cylinder charging station in a small building at a safe distance from the main plant. Here, spare cylinders are kept full and ready to go.

To change tanks, driver merely unsnaps fuel line and two buckles, then lifts off empty container. Full tank can be lifted on in a jiffy.

The containers provide safe handling of high-pressure fuel. They are tested at 1,600 lb. pressure, and are further equipped with relief valves set to blow at 275 lb.

Strict Care Wins Rewards

Company has set up a rigid preventive maintenance program to get top efficiency from its fork-truck fleet.

Each machine is carefully serviced after 100 to 150 hr. of operation. Running time is determined by meters installed on each engine. Every time a fuel cylinder is changed, driver notes meter reading on a tag, which is then forwarded to the company office. Here, figures are tabulated and when a machine reaches its maximum hours, the maintenance department is notified to pick it up.

Two fork trucks are serviced in each shift by a single man. This mechanic checks general operation of brakes, acceleration, and headlights while driving machine to the maintenance area.

Then he makes a thorough examination of the following points: Motor, electrical system, service oil filter, fuel system, cooling lines, battery, all grease and oil fittings, tilting and lifting mechanism, brakes, tires, crankcase oil, differential and transmission oil, and hydraulic system.

In addition, lift trucks are thoroughly steam-cleaned.

As each item is checked, mechanic ticks off appropriate place on a service chart. This is made up for each machine and contains truck number, operating hours, and date of servicing.

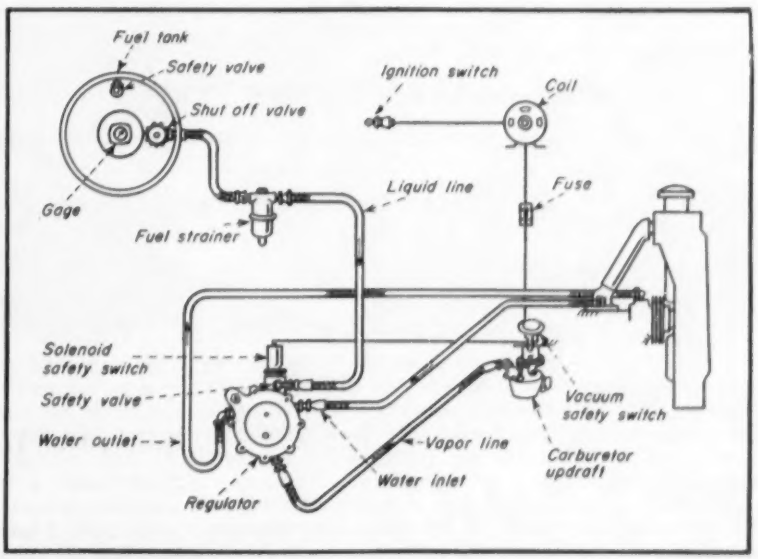
Parts replacement and repairs also are noted on the chart. When job is completed, mechanic enters time spent on machine and then initials report.

Gerber's maintenance department is equipped to make all minor and most major repairs. Overhauls and other complicated servicing, however, are done by a local fork-truck supplier.

Completed truck service chart is sent to the main office where information is transferred to a permanent register, along with cost of replacement parts and labor.

Amount and cost of fuel consumed during the operating period are also entered in the record.

The complete and accurate figures obtained from this maintenance system enable Gerber to determine exact operating costs, and thus confirm savings derived from the switch to LPG fuel.



SIMPLE FUEL SYSTEM comprises a pressure tank, vaporizer-regulator, and air-gas carburetor. No fuel pump is needed, because high tank pressure forces liquid through lines. Fluid vaporizes before it reaches manifold.

VEXING PROBLEMS in grievance and arbitration procedures are put to well-known arbitrator **Jules J. Justin** (left) and **AAA** vice-president **J. Noble Braden** (right) by **FE Associate Editor Ivan C. Miller.** You'll find the answers below.

Experts Give You Practical Answers on

Arbitrating Grievances

Keen insight into "sticky" personnel problems is reflected in answers to questions put by FOOD ENGINEERING to highly qualified authorities. And there is good advice on grievance and arbitration procedures

PART III CONCLUDING A TIMELY SERIES*

IVAN C. MILLER
Associate Editor, "Food Engineering"

Approximately 90% of management-labor contracts contain an arbitration clause. And thousands of labor management disputes are settled each year by arbitrators. Yet, many members of management do not fully understand how arbitration functions. Nor are they familiar with the thinking of arbitrators and the principles which guide them to their decisions.

More knowledge is needed, too, of the ways and means for preventing the growth of grievances into cases for the arbitrator.

To make such information available, FE interviewed J. Noble Braden, executive vice-president of the American Arbitration Assn., and Jules J. Justin, leading arbitrator and director of the Industrial Relations Workshop at New York University.

Following are more of FE's queries and the answers by these experts—

Orders Not To Be Obeyed

Q—It seems to be a well-established principle that, when an employee is ordered to do a job, he must obey and grieve about it later if he thinks the order was not proper. Are there any exceptions to this rule?

A (by Mr. J.)—Where the contract provides for an orderly grievance procedure, the (Turn to page 89)

*Part I. appeared in FE. Dec. '55, p. 63; Part II, in Jan. '56, p. 69

MONSANTO

Plastic package with recipe for cheese cake sells new customers!

RELATED-ITEM SELLING HAS DEALER APPEAL... BOOSTS SALE OF CHEESE...PLUS 6 STAPLES!

Another packaging idea, made possible by Monsanto's Lustrex styrene plastics, is paying off handsomely at point-of-sale!

This low-cost, transparent, fluted container for cottage cheese—with a recipe for cheese cake printed on the plastic lid—is demonstrating its appeal for both dealers and customers. Dealers like the way it is broadening the market for cottage cheese—and at the same time selling staples like gelatin, sugar, eggs, milk, lemons and graham crackers.

Shoppers are tripling their impulse purchasing of cottage cheese because the recipe gives them a new reason for buying.

The remarkable clarity, durability and printability of Lustrex styrene make it the perfect plastic for molding these containers. It is odorless, tasteless, nontoxic—and gives show-window display to the food inside.

The 14-oz. plastic container pictured, molded of Monsanto's Lustrex, is supplied in rainbow colors by the Massachusetts Plastic Corporation, Ludlow, Mass. Its cost compares favorably with conventional containers.

Monsanto will put you in touch with packaging specialists who will be glad to work with you in developing sales-making ideas for packaging your products. Write Monsanto Chemical Company, Plastics Division, Dept. FE-2, Springfield 2, Mass.

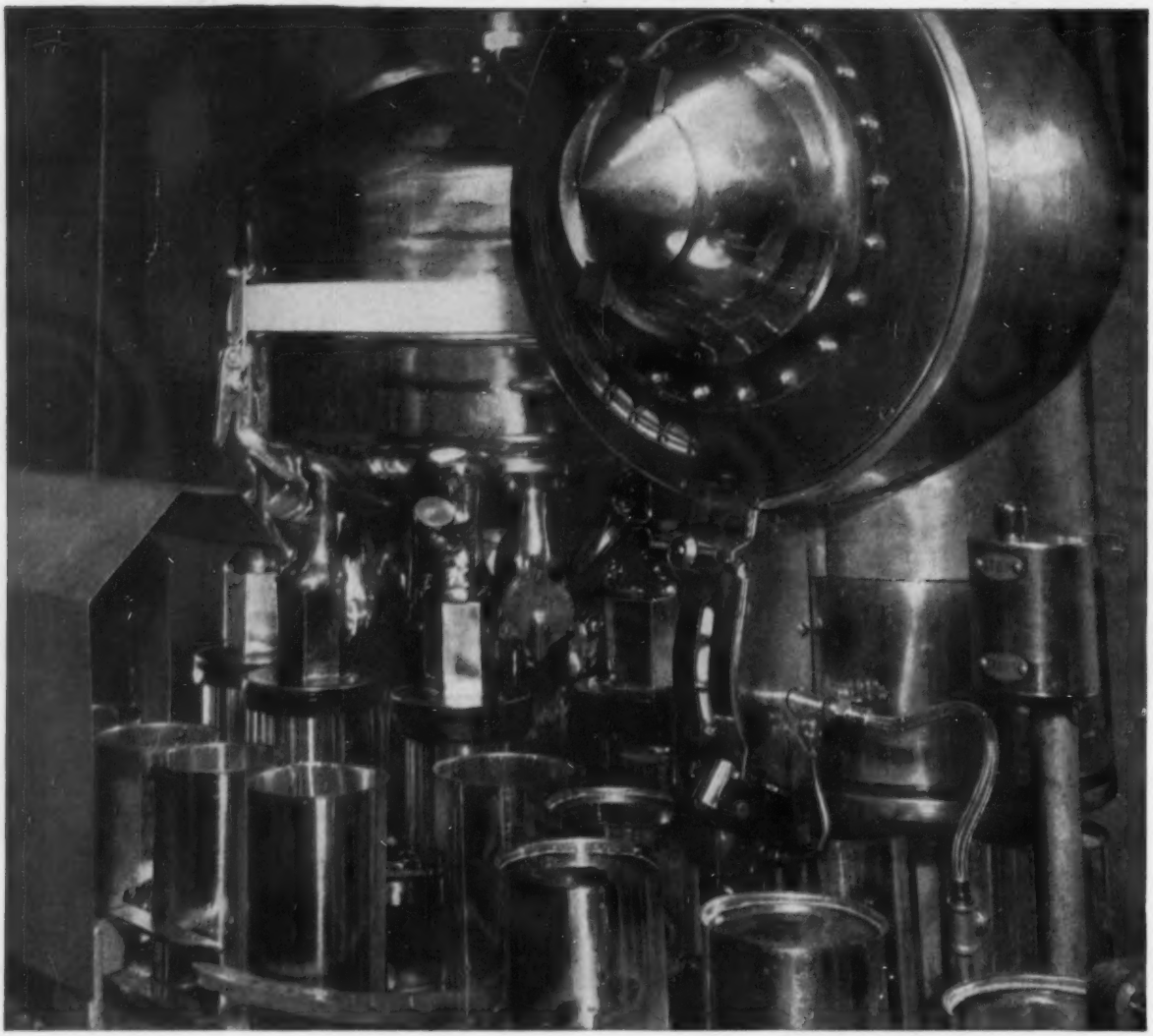
Talk to Monsanto about packaging your products in

LUSTREX*

styrene plastic

—also in polyethylene and Vuepak acetate*

**Lustrex and Vuepak: Reg. U.S. Pat. Off.*



stop down-time losses with TITANIUM...

Titanium parts last longer . . . eliminate costly repairs or replacements. For titanium is *exceptionally* resistant to many forms of corrosive attack . . . almost *entirely* immune to others. And titanium is strong—as strong as steel, but 44% lighter. What's more it protects even the most delicate food flavors.

Titanium can end corrosion problems in canning fruit juices—fish packing—condiment bottling—*anywhere* that corrosive conditions exist. It's a particularly good choice for small but vital parts, such as valve trim and fittings, screens or tubing, whose failure can cause losses all out of proportion to the cost of the part.

So check your own plant. Chances are good that you'll find dozens of places where REM-CRU titanium will more than pay its way in improved processing . . . less idle equipment time . . . lower replacement costs. A REM-CRU engineer will be glad to help put this unique metal to work for you. And it can be done *quickly*, for REM-CRU's expanded facilities mean prompt delivery of REM-CRU titanium in the grades and sizes you need.

To keep abreast of the latest developments on this vital metal, write to Dept. F-2 for the Rem-Cru Review—a free periodical presenting the latest technical data on titanium alloys.

REM-CRU TITANIUM

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employee is constrained to and must continue at work and obey the order, and file a grievance in the event of a disagreement regarding the order. This is general.

But there are several exceptions and supervisors should know them.

Management must never require an employee to do an illegal act, such as operating a fork-truck on a public highway.

No order issued by management need be executed it it involves personal or bodily harm to the directed employee or to any other fellow-worker.

There is another circumstance where an improper management order need not be obeyed. Since this circumstance is more difficult to grasp, it can best be clarified by illustration:

A certain company scheduled vacations and posted the schedule in the plant a month in advance. One of the employees then made all necessary arrangements to take a distant trip with family and friends during his scheduled vacation.

When the time came, others in the department were unable to work. So, at the last minute, management asked the employee to forego his scheduled vacation.

The employee, if thus constrained, could not make the vacation trip with his friends. Here the company could not have adequately put him back into the position in which he was originally—could not apply retroactive adjustment.

Before issuing such orders, management must ask itself this question: "Is this the kind of order which, if followed by the employee, though in error, cannot be retroactively adjusted?" If so, the order should not be given.

Borrowing, Pilfering, Stealing?

Q—When an employee commits a very serious offense such as stealing, can it be assumed that an arbitrator will find "just cause" for discharge, even in cases where the offending worker has a perfect past record?

A (by Mr. J.)—Yes. However a definition of the word stealing is required. Theft may be charged where there is no intention to steal. Sometimes the act then is called "borrowing."

An example will help to clarify. A machinist carries a shop tool from the plant to do some home repairs. The tool has been gone from the shop for several months, during which time it has been in the possession of the machinist. Nevertheless, there is a serious question as to whether he really intended to steal it.

On the other hand, a rule was broken when the machinist removed company property from the plant without authorization. This situation demands that appropriate corrective measures be applied, less to punish than to help the man help himself to be a better, more trustworthy employee.

Handling Away-From-Plant Offense

Q—An employee off duty committed a serious offense, was arrested, jailed, tried immediately, and found guilty—but was given a suspended sentence and returned to work immediately. It was not necessary to mention the company's name in the newspaper reports to make the scandal known to most of the employees, and to the local community as well. But because of the nature of the offense and possible repercussions on other employees, the company would prefer to discharge the culprit employee. However, no specific contract provision covers the situation. Under such circumstances, would arbitrator uphold a discharge?

A (by Mr. J.)—At times arbitrators do meet this type of case, and here is the basic rule I follow in endeavoring to arrive at a "just award." If the employee's offense away from the plant is of a kind which affects the company's products, relationship in the community, its good will in its markets—or if the employee's conduct away from the plant will affect his relations with his supervisor or with other employees during working hours—then if the contract provides that the company retain the right to discharge or to discipline an employee for just cause, I would uphold the company discharge.

If, for example, an employee was found guilty of using a knife—indicating that such action might recur in the plant to put other employees in jeopardy—his discharge should be sustained. Or if it is established that an employee drove a car wrecklessly, even though not intoxicated, then the question of the care of the company's machinery must be considered, and company action sustained.

Overlooking Is Condoning

Q—If an employee breaks a rule, is caught and is discharged, then the union may point out that other employees did the same thing but weren't discharged. And it may demand that this be the basis for the reinstatement of the guilty party who was discharged. Doesn't the union thereby advance the theory that several wrongs make a right?

A (by Mr. B.)—If management catches several rule infringers and overlooks their offenses, management has condoned their acts. Why therefore should another man who is caught be dealt with differently? When rules are not uniformly enforced that is management's failure.

This example may establish the justice of this viewpoint. In a chemical plant in Maryland, there is a strict rule against smoking, because of the explosive nature of the products. An employee at this plant was caught smoking and discharged. The grievance, resulting in a demand for reinstatement, finally went to arbitration.

When the accused employee was questioned, he addressed the arbitrator, saying, "I didn't smoke in the shed, I smoked on the platform outside where the sand pails are kept. And I will bet you, sir, that if you go up there *right now* you will find cigarette butts thrown there this very morning."

The arbitrator asked everyone to remain behind except one man from management and one man from the union. Then together the three went up to inspect. In each of a number of pails was found a collection of butts. Furthermore, some cigarette remains were on the platform where they had been stamped out hurriedly when the delegation arrived.

The evidence indicated that management had been aware that employees smoked on the platform, but took no action. Then suddenly management picked one man out of the crowd and administered punishment.

The way to enforce a rule long overlooked is to bring to the attention of every employee—by bulletin-board, employee magazine, and direct notification—the fact that the law or rule henceforth will be rigorously enforced. Thereafter, caught offenders may be justly punished.

The phrase "equal justice under te law" should be kept in mind in this and in similar situations. And remember that the collective bargaining agreement is the law between the parties.

Different Penalties . . . Same Offense?

Q—Where two men are guilty of the same offense, does the company have to to impose identical punishment, even though one may be a chronic offender while the other is a more desirable employee?

(Turn page)

A (By Mr. J.) No. Management does not have to apply the same penalty to two or more employees who breach the same rule or commit the same offense—unless established rules or regulations of the company provide for a specific penalty. In that case, the company is limited to the penalties prescribed for specific offenses.

If management takes into consideration the past conduct record of an offender, it has a right to say, "in this man's case a written reprimand is sufficient corrective measure. Whereas in the case of another individual who was previously reprimanded for a breach of the same rule, I would uphold the company's right to take different disciplinary action.

Comment by Mr. B.–The principle is the same as that which applies in our courts. A man with a criminal record will, and should, be given a much heavier sentence than a first offender.

Can't Short-Cut Procedure

Q—In many contracts, the procedure for grievance settlement is scheduled to advance according to a timetable, completion of which may drag out for days. Oftentimes it seems advisable to expedite things and go right to arbitration. Isn't it enough when parties come to arbitration that they submit the issue in dispute and then disregard possible oversight or skipping of the steps as defined in the contract?

A (by Mr. B.)–If both parties agree to changes of the timetable or skipping of any procedure steps, then it is O K that they do so. However, if the contract calls for a three- or four-step grievance procedure with time limits, very seldom will one side allow the other unilaterally to skip any of those steps. And they shouldn't, because it is a contract obligation to go through them.

On the other hand, it depends on the contract. As an example, that of the Brewers Board of Trade in New York requires that the parties go to arbitration within 48 hours.

Write Better Contract

Q—Is it possible in any way for management to rush the issue to as early a settlement as possible so as not to have to face paying enormous back pay if a case is decided against the company?

A (by Mr. B.)–Unless there is some provision in the contract which permits either party to invoke arbitration at any step of the procedure, then there should be no deviation from the normal grievance procedure.

Situations like this usually result in the writing of a more clear-cut contract when the next one is negotiated.

Arbitrator Has 30 Days

Q—Speaking of grievance timetables, how soon after the evidence must the arbitrator render his decision?

A (by Mr. B.)–Within 30 days is our Association rule. In the absence of rules, God help all involved.

Two-Way Respect Cuts Trouble

Q—Under what management-labor situations or relationships does the greatest number of grievances advance to the arbitration stage, and when may the least arbitration be expected?

A (by Mr. B.)–Whenever there is a poor relationship between management and union, there will be strikes. And between strike periods there will be many disputes that end in arbitration.

When both sides build respect for one another, grievances are fewer. It has proved vital to industrial peace to sit down and discuss differences at their very beginning, or refer them to arbitration immediately.

Take, for example, a firm that engaged a permanent arbitrator on an annual basis to decide all unsolved differences between management and the union.

Everything in the pot was thrown at the arbitrator the first two years, and he was arbitrating all the time. Then management and the union started reviewing the decisions that had been made in the different kinds of cases. After that, neither side needed the services of an arbitrator for about 10 years.

So it would seem that merely sitting together under arbitration and bringing out the facts will aid in building up an understanding.

There is great value in hearing the other fellow during a discussion of differences. And when both sides sit around the table, they get to know the other fellow. Theodore Roosevelt is credited with saying: "If you want to hate somebody, don't let yourself get to know him."

In labor relations negotiations of any caliber, it doesn't pay to sit down as an antagonist. Rather, try to get to know the other side and to see things as they do–as well as to have them see things your way.

It Pays Management to Listen

Q—What advice can you give to management regarding procedure in the early steps of grievance processing?

A (by Mr. J.)–As a part of its right to direct, it is management's responsibility to allow grievances to be raised and to duly process them, striving honestly thereby to solve the problems. This applies even when apparently there is no violation of the contract. Yes, even when obviously the grievance is only a groundless gripe.

Just as unions and the employees have to pay a certain price for job security, so also in my opinion must management pay the price of listening to employees in order to build employee morale and thus to enhance production volume and product quality.

Doesn't Pay to Withhold

Q—Is it advisable for management during grievance processing to hold back some of its arguments in order to have the advantage of surprise if later the case should go to arbitration?

A (by Mr. J.)–Management gains no advantage later during arbitration by holding back any material facts during grievance procedures. It should always be remembered that processing cases through prescribed grievance procedure is in fact a continuation of collective bargaining. Parties thereto should be objective, and certainly management's objective should be to speedily solve all grievance problems and thus find out what is the real basis for the gripe or complaint.

Grievance processing should form the basis of contract clarification and also the basis for rewriting the new contract.

"Second Chance" Not Warranted

Q—What circumstances, if any, should control second chances? When arbitrators are inclined to give a man a "second chance," doesn't that amount to "giving every dog one free bite?"

A (Mr. J.)–I speak only for myself when I say that

(Continued on page 208)

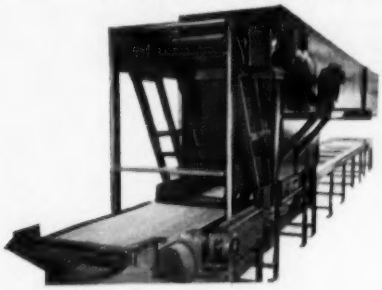
GREER EQUIPMENT

lowers cost, improves quality of prepared fish, meats and poultry

SAVE COOKING TIME AND LABOR

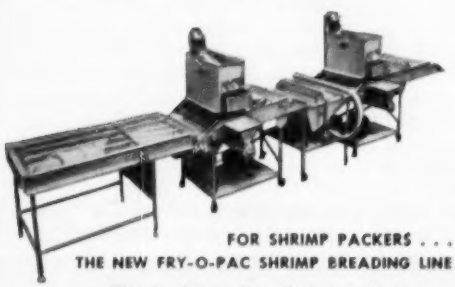
Fry-O-Pac Cooker changes frying from batch to continuous processing for profitable mass production. Connects directly to breading machine.

Exclusive new 2-stage filter continuously removes foreign particles; extends oil life. Filter available separately for existing fryers.



COOL AUTOMATICALLY, TOO

Multi-Tier Cooler eliminates racks. Packs 196′ of controlled cooling in only 15′ of floor space. Automatic loading; built-in packing table.



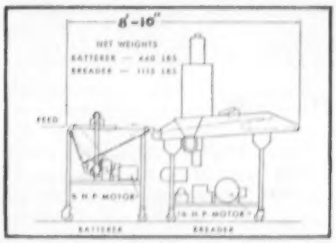
FOR SHRIMP PACKERS . . .
THE NEW FRY-O-PAC SHRIMP BREADING LINE

Boosts shrimp breading capacity up to 150 pounds/hour per worker (raw product). Smooth, gentle processing delivers uniformly-breaded shrimp ready for packing. No tumbling of product.

The Standard FRY-O-PAC Batterer and Breader

FOR:

- FISH STICKS
- FILLETS
- SCALLOPS
- CUTLETS
- PATTIES
- CROQUETTES AND OTHERS



Completely eliminates manual dipping and breading. Increases production 3 to 5 times per worker over hand breading alone. Practically eliminates lumps. Accurate batter/breading percentage control. Available in double breader models for extra-heavy breading pickup.

WRITE today for informative Fry-O-Pac Bulletins 55-2 and 55-4. Ask for detailed information on continuous filter system.

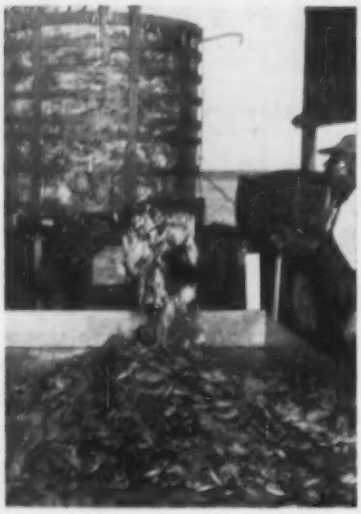
J. W. GREER COMPANY

Wilmington, Massachusetts

Sales Engineering Offices: Chicago, Ill., and San Francisco, Calif.

GREER

Step-by-Step Cake Making Procedure



1 CRABS are cooked in a retort, then dumped on stainless platform to drain and cool.

2 COOKED MEATS are removed from shells and placed in cans. Filled cans are weighed and packed in ice for shipment to the fresh market, or transferred directly to adjacent processing room.

Method Maintains Quality in Crab Cakes

Island plant insures maximum freshness by quick handling. Advanced inspection guards against shell fragments

FE STAFF

From freshly caught live crabs to frozen specialties in both consumer and institutional packages in a single continuous operation.

This, briefly, describes the crab cake operations at Tilghman Packing Co., Tilghman, Md.

Location of its plant on an island in Chesapeake Bay, where crabbing boats unload their catches each morning during the season, assures the company a steady supply of quality raw material.

And the large demand for fresh crab meat permits cooking, and picking of meat from shells, on a daily basis. Then, when meat is needed for the specialties operations, the fresh product can be obtained directly from the adjacent picking room.

Immediately following processing, specialties are packaged and rushed to the freezing room.

Now let us look at the steps involved in making the different crab items—regular (Imperial) crab cakes, deviled crabs, deviled crab cutlets, and bite-sized deviled crabs, as well as frozen oysters (plain and breaded) and fish sticks.

Starting point is weighing the barrels of live crabs as they are unloaded from fishing boats. Then the barrels are dumped into large metal baskets, which are lifted by an electric hoist and conveyed to the cooking retorts.

Following cooking, baskets are lifted from retorts and moved over a large stainless platform and the crabs dumped onto it to cool and drain. When cool they are taken from the platform and transported to the picking room. Here, women remove meats from shells, placing the former in special cans for shipment to fresh market or transfer to processing.

One of the unique quality controlling factors in processing of the crab meat is the special types of inspection.

The inspection "table" comprises a white rubber belt above which is mounted a special lamp that emits ultra-violet light, known as "black light."

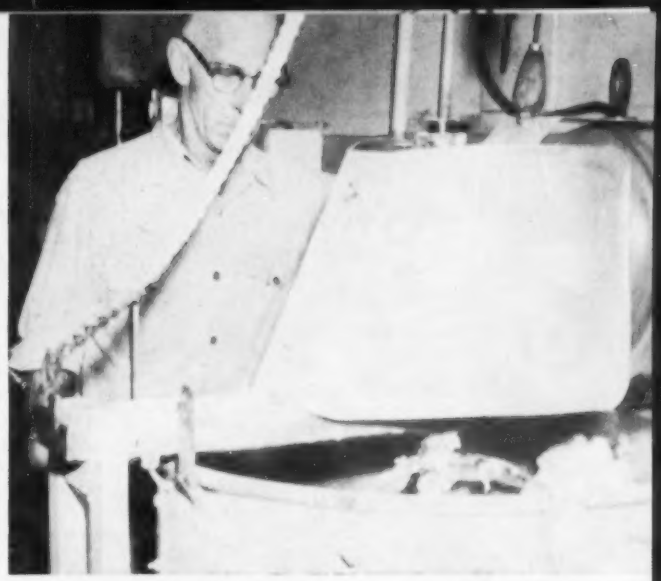
Crab meat is emptied onto one end of the conveyor belt and moves under the uv. light. Particles of shell fluoresce and appear to be purple in color, while color of the meat is unchanged. Under these conditions the inspectors find it easy to detect and remove any shell fragments.

Meat for deviled crabs is then mixed with a special flavored sauce, and the mixture is fed to a patty-former that automatically molds it into cakes of the desired size. (A somewhat different mixture is employed for Imperial item.)

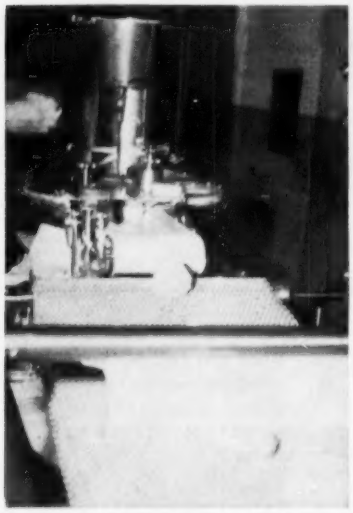
Next, cakes move over a Harrison breader, where they are coated with batter and breading compound, and are discharged into pans of crumbs.

Here, women inspect the cakes for complete breading. For cutlets, they are placed in special molds that modify the shape to that resembling a veal cutlet. Molded cakes are packed in waxed containers, which are overwrapped and sealed—institutional packages in plain waxed paper, consumer packs in multi-colored aluminum foil. Wrapped packages go directly to the −20 F freezing room.

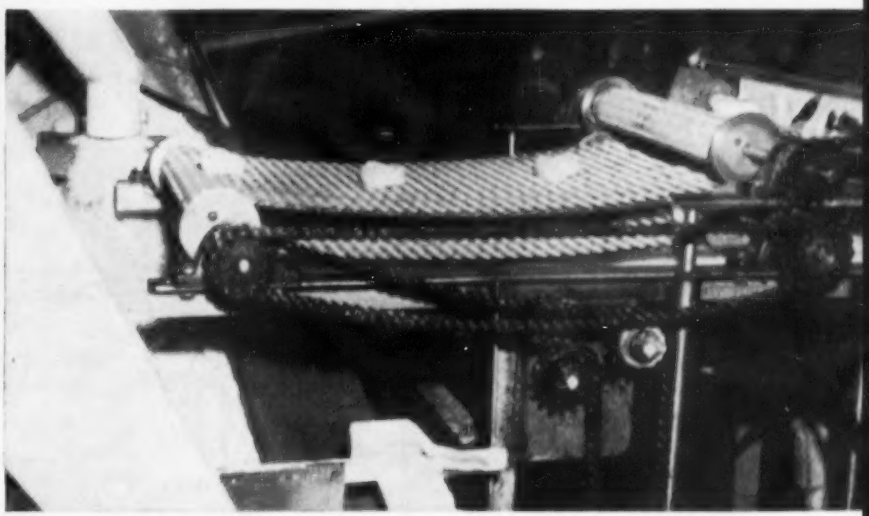
3 FOR CRAB CAKES, the cooked meat is carefully inspected under "black light", which causes any shell fragments to fluoresce and appear purple in color.



4 SEASONED SAUCE is prepared in a steam-jacketed kettle, then crab meat is added and carefully blended with it.

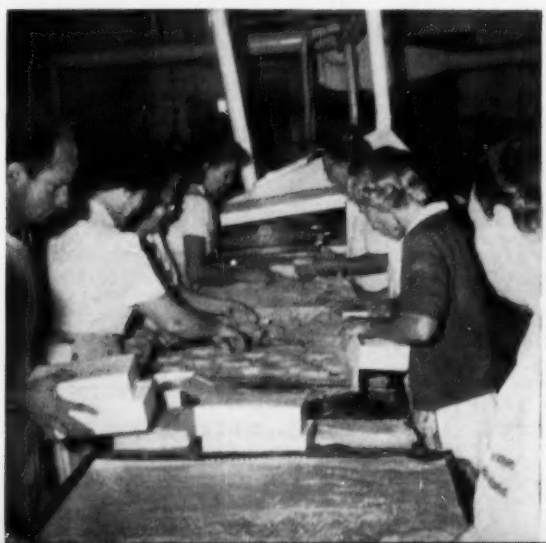


5 MIXTURE is automatically formed into cakes, which are conveyed under batter curtain.

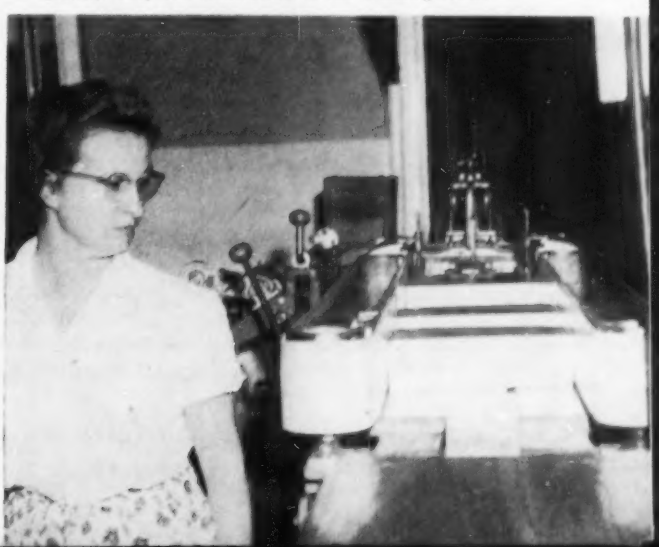


6 CAKES are breaded, then pass under second batter curtain (right), are drained on conveyor (center), and discharged into stream of crumbs on conveyor (left), for further breading.

7 SHAPING ("cutlet" molding seen here) is followed by packing in wax cartons.



8 CARTONS are automatically wrapped and sealed. Subsequently, they are transferred to the freezing room.



S/K apades in industry

"I'M FED UP!" screamed Simpkins, the Superintendent. "I've had it, and I'm fed up. That mixer has GOT TO GO!"

"But boss," soothed Barney, the Bird Dog Assistant, "that mixer can't be shut down. The Front Office has already told us . . ."

"OUT!" interrupted the seething Super.

". . . that if we can't spark up production, changes are gonna be made," finished Barney.

"YOU'RE RIGHT," said Simpkins coldly. "You're *so* absolutely, *definitely* right. Changes *are* gonna be made—NOW!"

"Can't we talk this over, man-to-man?" mumbled Barney. "Seems to me . . ."

"Sure we can talk it over," said the Super, "*sure* we can. C'mere m'boy. I'll talk, and you listen.

"You've got two weeks. Two weeks to GET THAT MIXER OUT and something an awful lot better in. That's your mission, boy, an out and out case. The mixer or you. Think it over," said the Super, with a man-to-man pat on the back.

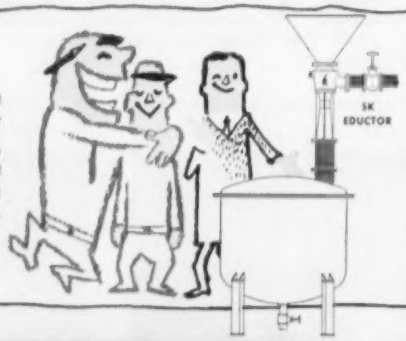
THE CASE OF THE MACHIAVELLIAN MIXER AND THE SATIATED SUPERINTENDENT

"...need your help," phoned Barney to his nearest SK Sales Engineer. "I've thought over this problem I've told you about, read SK's Bulletin J-1, and I think a jet of some kind is right for the job."

"YOU'RE RIGHT," replied SK's nearest Sales Engineer. "You're so absolutely, definitely right. An SK Water Jet Eductor will do the job, and I'll be right over to tell you how."

NO BIRD DOG NOW

Now, thorough mixing of dry powder and a liquid prior to discharge into a tank is accomplished by the use of an SK Fig. 235 Eductor as shown. Pressure liquid enters the eductor, entrains the powder, mixes the two in the venturi of the eductor and discharges the mixture into a receptacle. The streamline design provides maximum efficiency. No bird dog now, Barney is consulted on every production problem—bowls with Simpkins every Thursday night.



MORAL:

Get acquainted with all types of SK Jet Apparatus. Send for a copy of Condensed Bulletin J-1. Make use of a qualified specialist, your nearest SK Sales Engineer.

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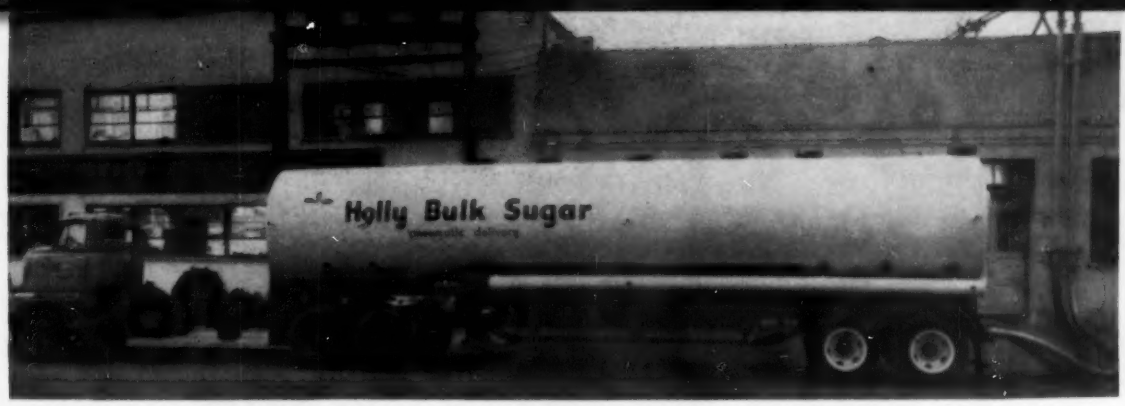
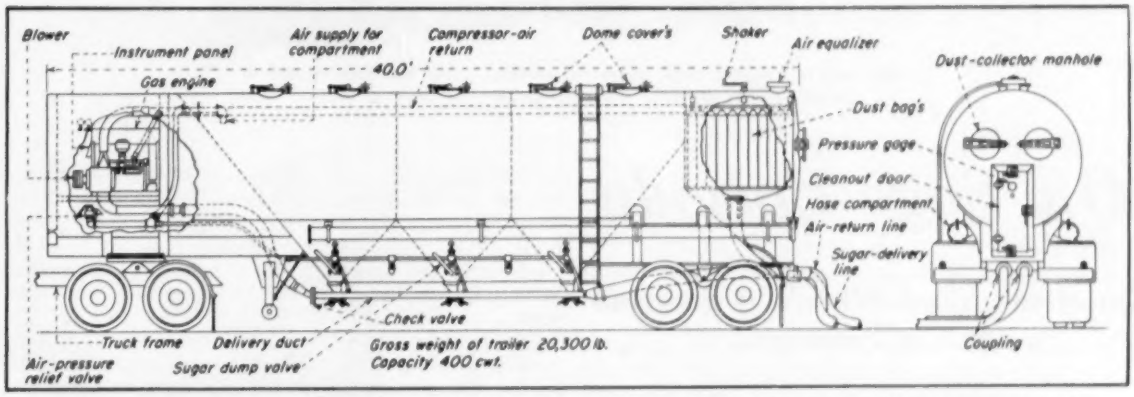
HEAT TRANSFER APPARATUS: Ask for Condensed Bulletin HT-1.
GEAR PUMPS: Ask for Bulletin 17-A.



CONNECTED to customer's receiving system, this bulk trailer delivers granulated sugar into candy-plant bins.



SCHEMATIC shows key parts of Holly's unusual bulk trailer. Unit has dust collector, power unit, and instrumentation.

New Bulk Sugar Trailer Unloads 20 Tons/Hr.

Powerful pneumatic handling system lifts product 100 ft., or moves it 200 ft. horizontally

FE STAFF

Sugar is pnuematically conveyed at a rate of 20 tons an hour by each of two unusual bulk trailers put into operation by Holly Sugar Corp., Colorado Springs, in the San Francisco and Los Angeles areas.

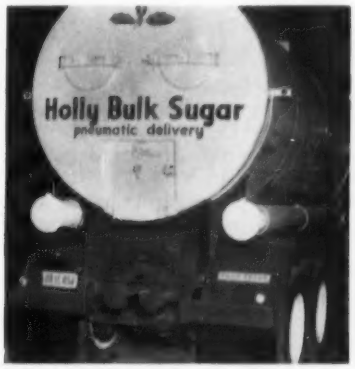
Two positive displacement blowers, belt-driven by gasoline engine, convey sugar through 6-in. dia. aluminum ducts to plant storage bins. The unit is capable of moving sugar a distance of 100 ft. vertically or 200 ft. horizontally from the trailer.

Sugar discharges into the air stream via manually operated sugar gates, becoming airborne in a stainless steel duct running the length of the trailer. This duct is connected by a stainless hose and quick-disconnect fittings to the plant system.

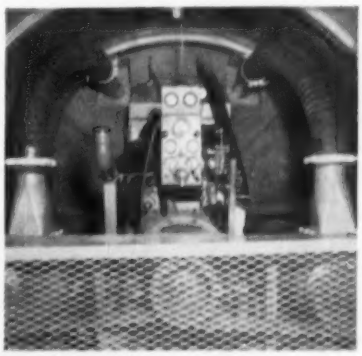
As the airborne sugar enters the in-plant storage bin, air velocity is reduced, and the sugar drops into the bin. Free air is discharged through a return line, carrying any residual airborne powder or dust. This line is connected to the trailer's dust collector, located in a rear compartment of the unit. Powder is removed here from the airstream, dropping into a recovery hopper, and the clean air is recirculated to the blowers to complete a closed system.

Customer storage bins are designed to withstand 10 psi. pressure. They are constructed of mild steel, and usually are plastic-lined. Lines carry

(Turn to page 154)



REAR VIEW of bulk sugar trailer. Outlets for hose are at bottom center.



TWO DUCTS from engine-driven blowers serve unloading system and pressurize hoppers.

"Ole says this makes them on managements' team, but they're still in the union with seniority rights. I claim they can't be both."

Ole Sage Episode

Question raised–When's a Foreman Not a Foreman?

IVAN C. MILLER
Associate Editor, "Food Engineering"

"Why all the furor about foremen," thundered Batt Bulwark, works manager of Mull & Mull Co. Before continuing, his eye swept the silenced attendance at the Guff & Gripe Luncheon Club, swelled on this occasion to double by the presence of guests as well as regulars.

"Foreman training . . . foreman training . . . you'd think they were VP's . . . time off for meetings . . . time off for courses . . . courses in humantics, semantics, 'ologies, and 'cologies–maybe even knitting, yet!"

Batt paused for breath, then roared on, "Different in my day . . . production, production. That was it. I learned to roll out the volume. That was my job and I did it, and I didn't take any training courses."

"Well, are you all through now, Batt?" asked personnel manager Milt Sorenson.

"No," boomed Batt, addressing himself to Ole Sage, "Just one more thing. I am not belittling you, Ole, neither your years of experience nor the work you are doing around here . . . but I do say this foreman training thing's gone too d– far."

"No hard feelings I hope," grinned Ole. Then before he could continue, a new member of the group, Dick Duwell, cut in: "Guess I'm the youngest here in both age and experience. I'm a guest, and besides I'm only a supervisor and quite new at it–so maybe I should keep quiet. Just the same, I do hope all of you fellows here who know the answers won't mind my wanting to know just these two things: First of all, what's the difference between a foreman and a supervisor? And next, just how important is each?"

The chuckles around the table eased the tension that usually followed Batt's bellowing.

Ole Sage, to whom most eyes were turned, answered, "First things first, and the rest should fall into place. In general, reference to 'foremen' or 'supervisors' means the same thing. In the food industry, and probably in others, too, the one who issues orders direct to employees, schedules work, hears grievances and settles them if he can—he is first-line management. Depending on the kind of food plant, and sometimes on area its in, a foreman's immediate boss may have the title supervisor, and vice versa."

Ole paused to lay aside the pipe he habitually puffed to accept and light a long stogie offered to him by Batt. In the interim, Duwell confused the issue with still another question, "What's a 'group leader,' and 'assistant foreman,' a 'production supervisor'—and where do they fit."

The stogie lighted, Ole continued, "Titles are often so confusing they have lost real meaning, except as related to the specific job and plant. It's the responsibility and the authority that goes with the job that makes it *first-line management*, or not. Unless he has something to say in the selection of those that work under him—unless he is authorized to administer proper discipline for rule violations and has a voice in discharges 'for cause'—then he is not first-line management, no matter what his title. When the title is justified, then, foremen and supervisors are first-line management—*they are on the management team.*"

Addressing young Duwell, Ed Strong, superintendent of Zenith Canning Co., asked: "Now that you have your first question answered, Dick, where do you stand?"

"I'm in," grinned the new supervisor. "I'm management —in a small way, of course. That's just it. Actually, how important is my spot?"

"How important?" repeated personnel manager Sorenson, who then volunteered to answer this one of Dick's questions. "When I think of foremen I am reminded of one of Lincoln's comments, that 'God must have loved the common people, he made so many of them,' or something like that."

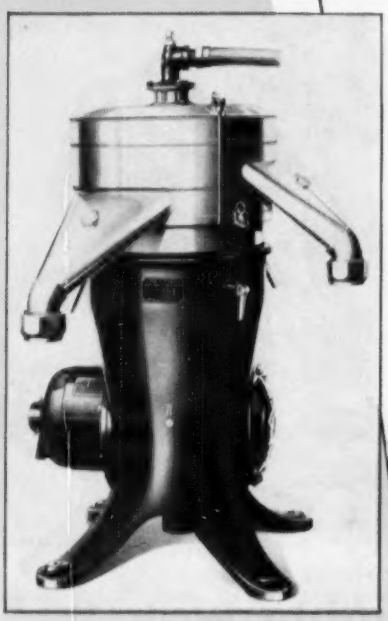
Milt Sorenson paused, glanced around the table, and remarked, "It was Lincoln, wasn't it?" Getting a nod or two of assent, he continued, "In the food industry, at least some 80,000 foremen or supervisors are functioning as first-line management. And as such, they are approximately 90% of the management team that last year turned out more than $50 billion worth of food products."

"If they are all that," agreed Ole, "then they are mighty important."

Batt pounded on the table as he roared, "Milt's making big ones out of little ones, but it doesn't sell me. When anyone tosses around big figures like Milt, I want to know

STRAIGHT LINE

...shortest distance to profits!



Why separate with slow, roundabout filters or settling tanks—when you can use a time-saving, profit-making *straight-line* method? . . . De Laval Centrifugals!

Many of the most efficient chemical and food plants find that De Laval Centrifugals make separation a *continuous* process, eliminate production bottle-necks, cut costs.

They have discovered that De Laval Centrifugals —whether used for separation, clarification or concentration—quickly pay for themselves . . . frequently *improve the product* by doing a *better* job.

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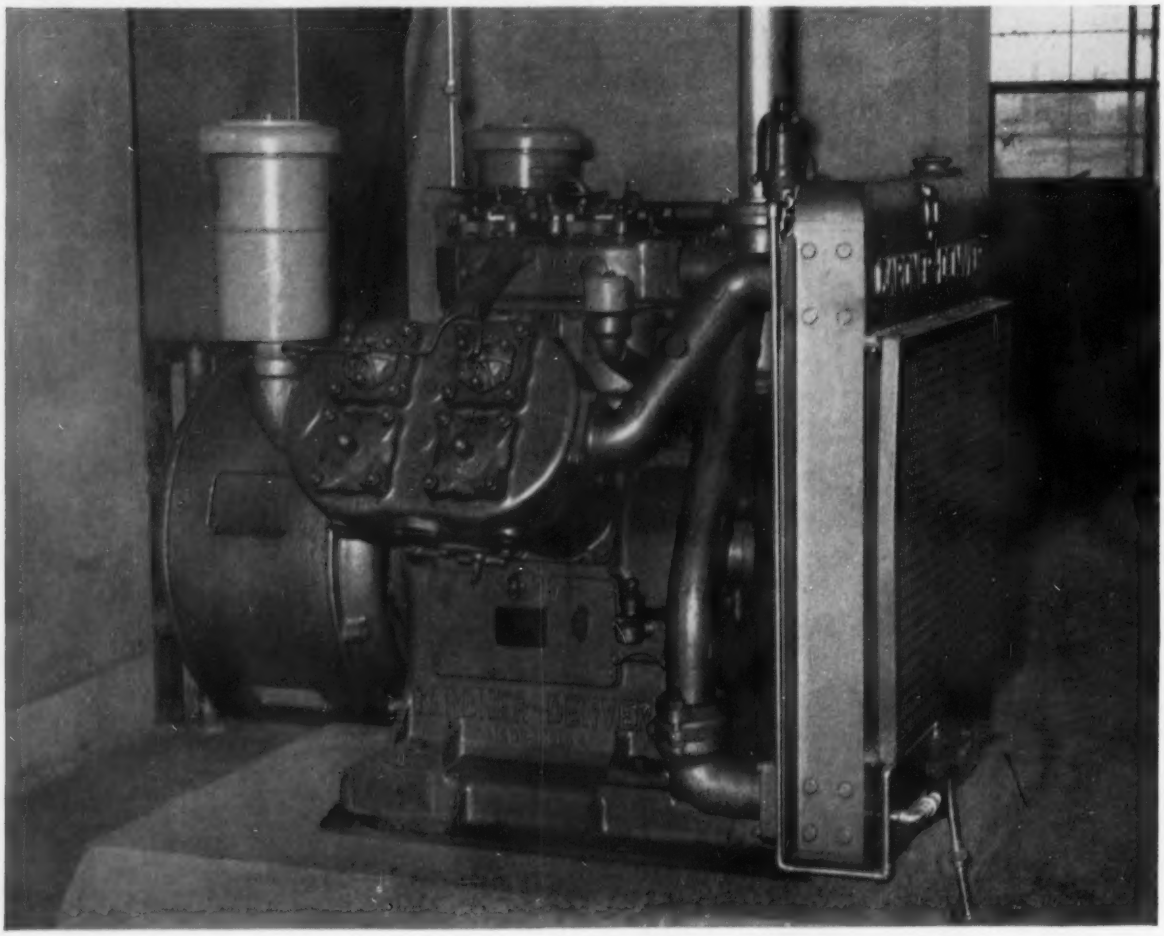
Gardner Denver . . . Serving the World's Basic Industries



Moves in fast . . . starts right away . . . Gardner-Denver WB Compressor

It's as easy as it looks in this picture to install a Gardner-Denver WB Compressor. Hook up the wiring . . . air line . . . controls—that's about all there is to it. Not much of a foundation is needed—because vibration has been designed out of the machine. The packaged unit has a built-in motor, and a self-contained radiator-intercooler that solves cooling-water problems.

Available in seven sizes from 142 to 686 cfm. Write for Bulletin WB-10, with full specifications.

Another popular Gardner-Denver compressor—noted for long, steady runs—the model AA. Bulletin AA6.

GARDNER - DENVER

THE QUALITY LEADER IN COMPRESSORS, PUMPS, ROCK DRILLS AND AIR TOOLS FOR CONSTRUCTION, MINING, PETROLEUM AND GENERAL INDUSTRY

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where they come from and have proof that they are even half right."

Milt launched confidently into his justification, apparently not disturbed by Batt's doubts, "If we consider only those food plants with 20 or more employees, current Department of Commerce figures indicate total employees in these plants as approximately 1,200,000."

Milt paused for a sip of now-cold-coffee before addressing Bulwark, "What do you consider, Batt, as the average number of employees in the food-plant groups for which a foreman or supervisor is responsible?"

"Looks like I'm about to walk into a trap," Batt twinkled. "It's hard to say, but I guess the average to be somewhere between 10 and 20." Around the table there seemed to be agreement.

"Well," calculated Milt, "That gives us between 60,000 and 120,000 foremen in the food industry, just in the 20,000 plants with more than 20 employees. And that's not counting the 16,000 smaller units—where all too often the owner is foreman and all other management as well. So my 80,000 figure for the food industry's foremen could be conservative."

"You're off the hook on that one," grumbled Batt, "and I'll grant the 50 billion figure for the industry's sales volume—we all know that. But how can you justify that *90% of management* statement."

"I was quoting," admitted Milt, "and I'll let you judge the worth of the source. You are familiar, I hope, with NAF, the non-profit association dedicated to training foremen for greater management efficiency. Here is what the National Association of Foremen has said, in gist, if not word for word:

'The associations objectives are to give foremen the confidence of being management, and to make industrialists realize that foremen and similar supervisors constitute a *good 90% of the management team*'."

"That let's you off all the way," begrudged Batt. "But Ole's on the hook for something he said, and I don't think he'll get off so easily."

The group eyed Ole, who admitted, "No one ever gets anywhere without being wrong on occasion. Let's have it Batt."

"Ole, you said something like this, 'they run the departments, have a voice in hiring and firing, they assign work, initiate raises, transfers, promotions, hear grievances, and dish out discipline, and so forth. Foremen and supervisors are first-line management,' you said. *'They are on management's team.'* Now that's what you did say, isn't it?"

Batt paused, and then with Ole's nod of agreement, he continued, "Just this year, during contract negotiations at our plant, a representative of the union read from the International Typographical Union's contract with Chicago newspapers this paragraph which defined foremen's duties. I copied it down in my notebook for just such an occasion as this." When he had flipped pages to the right one, Batt read from it:

"The foreman, *who must be a member of the union*, shall be the judge of a man's competency as a workman and of his fitness to work in the office. The foreman shall have the right to employ help and discharge for incompetency, for neglect of duty, for violation of office rules, and to decrease the force."

Batt closed the notebook and tucked it in his coat pocket, advising, "That situation is not unlike many in the food industry where the nature of the plant and product result in seasonal employment fluctuations. Many canning and freezing plants are of this type—and other food plants, too.

"Now, in many of the contracts of such plants is a clause which permits some of the workers to serve as foremen during peak season—and at the same time retain seniority in the union. They are on a loan basis, as it were. When work slackens and seasonal employees have migrated, these 'foremen' may be returned to labor's ranks or may remain on 'management's team.' While serving as foremen, they have the authority and responsibility which Ole says makes them on management's team, but they are still in the union with seniority rights. *I claim they can't be both.*

"What's more, I claim Ole's on a limb because he didn't leave himself one single loophole. And I confess that I get a big bang out of putting him over a barrel." Batt's conclusion was greeted by a burst of hearty laughter.

Ole chuckled at the laugh on him, as though pleased at being backed into a corner, and then spoke: "Batt's right. I said something on a situation that has long been very controversial—and I didn't qualify. Now, I admit I don't know the answer, but I wish I did."

Some of the group pushed back chairs, getting ready to leave, when Batt bellowed, "Wait a minute, I've been sidetracked. At the beginning of today's session I blasted foreman training, and for good reason—and what's more I gave Ole a chance to justify it. Well, how about it?"

All agreed that the time had run out, but that they would turn the next meeting over to Ole and give him a chance to justify, if he could, the trend toward more and more foreman training and to have him explain of what in his opinion such training should consist.

Batt lamented, "And that gives Ole a chance to bone up for the next meeting. Oh well, why not? He'll need plenty of study!"

From Ole's Notebook

Human, vs. Labor, Relations

"To my mind 'human relations' means very simply relations with humans—relations with people. It is to me a good deal broader than labor relations, in that it includes management relations. It is broader than industrial relations in that it includes, to some degree, both public relations and community relations. It is, in fact, the only field that crosses the line of every department, every office, and every factory operation.

"In line with that thinking, we can then state definitely that the man whose job functions restrict him to labor relations or industrial or personnel relations does not, in my view, exercise an over-all responsibility for human relations."—*Frederick J. Bell, Executive Vice-President, National Automobile Dealers Assn., before California Personnel Management Assn.*

Mutual-Interest Dividends

Much may be gained by full cooperation with the union in areas of mutual interest.

If all during the year foremen and stewards have participated together in programs and thereby learned to know each other better, the climate surrounding the annual negotiations will be better.

For example, suggestion-committee work, safety drives, anti-absenteeism programs, good housekeeping, social and sports activities, and open house affairs are basically non-conflicting endeavors in which company and union have a mutuality of interest.

However, in the field of contract negotiations, grievance procedure, and arbitration, the interest of the company and the union are frequently at

(*Continued on page* 183)

In Behalf of Progress . . .

FDA Shows Zeal Beyond Need or Reason

The zeal of Food and Drug Administration is highly commendable, and usually is tempered with good sense. This is why that important government agency gets nearly unanimous support—and almost continuous encouragement—in its effort to protect the public against anything dangerous in the fields of foods, drugs, or cosmetics.

Now the agency appears to have gone too far. Its extreme action a while back in decertifying three food colors is in striking contrast with its usually constructive attitude. And the announcement of that action shows an interpretation or application of the Food and Drug Law which one certainly cannot believe Congress intended.

In announcing the order of decertification, FDA says: "The law requires that food colors be certified as completely harmless".

Congress did NOT say that. Congress said only "harmless." Furthermore, Congress made it clear that colors used must be "suitable for use in foods."

Congress clearly intended that sound professional judgment be exercised, based on the conditions of use, the quantities employed, and the foods to which the color is added. Even Congressmen with a surplus of political zeal would not presume to say that anything can ever be "certified as *completely* harmless." To do so would exhibit a lack of good sense, which a Congressman always seeks to avoid.

FDA Commissioner Larrick says: "The three colors involved are harmless in the amounts ordinarily consumed in foods, but recent scientific investigation shows they are not harmless when fed in large amounts." And yet FDA recommends, and the Secretary of HEW orders, that these colors—even when so safely used as to be harmless—must not be used at all.

We suggest that FDA reconsider this situation. Why not certify that these colors are permissible only when used on certain foods in certain proper quantities?

That would make sense. That would protect the public. That would prevent misuse by any of the careless or the ignorant in the industry. That would carry out the obvious intent of Congress. Such action would doubtless also command almost universal support and cooperation.

No one wants to take a chance on public health or welfare. But no one can justify an extravagant and unnecessary extension of that desire to the point of interfering with proper practices long established without any evidence whatsoever that anyone has ever suffered from them.

Who Will Take Cook Out of Kitchen by '66?

In 10 years, no housewife will need to know how to cook. That is a recent prediction by Food and Drug Commissioner George P. Larrick.

If the pre-processed food trend continues to keep pace through chemical advances, by 1966 all the fair lady will have to do is heat or chill anything from a snack to a complete dinner, the Commissioner believes.

"Cooking will then be an art rather than a necessity."

That is a fair estimate of the challenge ahead of our industry. But anyone familiar with the problems and pitfalls of developing, making, packaging, and distributing new food items knows all too well the magnitude of the technicalities involved.

So the opportunity spotlighted by the Commissioner cannot be realized without more help from food engineers, technologists, and scientists.

And that puts new emphasis on the urgent fact that associations, companies, and individuals in the food manufacturing field have to take some major steps to get more technical manpower into the industry.

New data on the industry's technical shortcomings have been revealed through a preliminary report by National Science Foundation on research and development costs and personnel (1953-54).

There are in the food and kindred products industry only 14,400 scientists and engineers of all types. Compare that figure with the 62,700 in the chemical field!

The food industry is spending but $54,200,000 on research development—as against $361,100,000 for chemicals. The food field figure is but a fraction of that required to take cooking out of the kitchen.

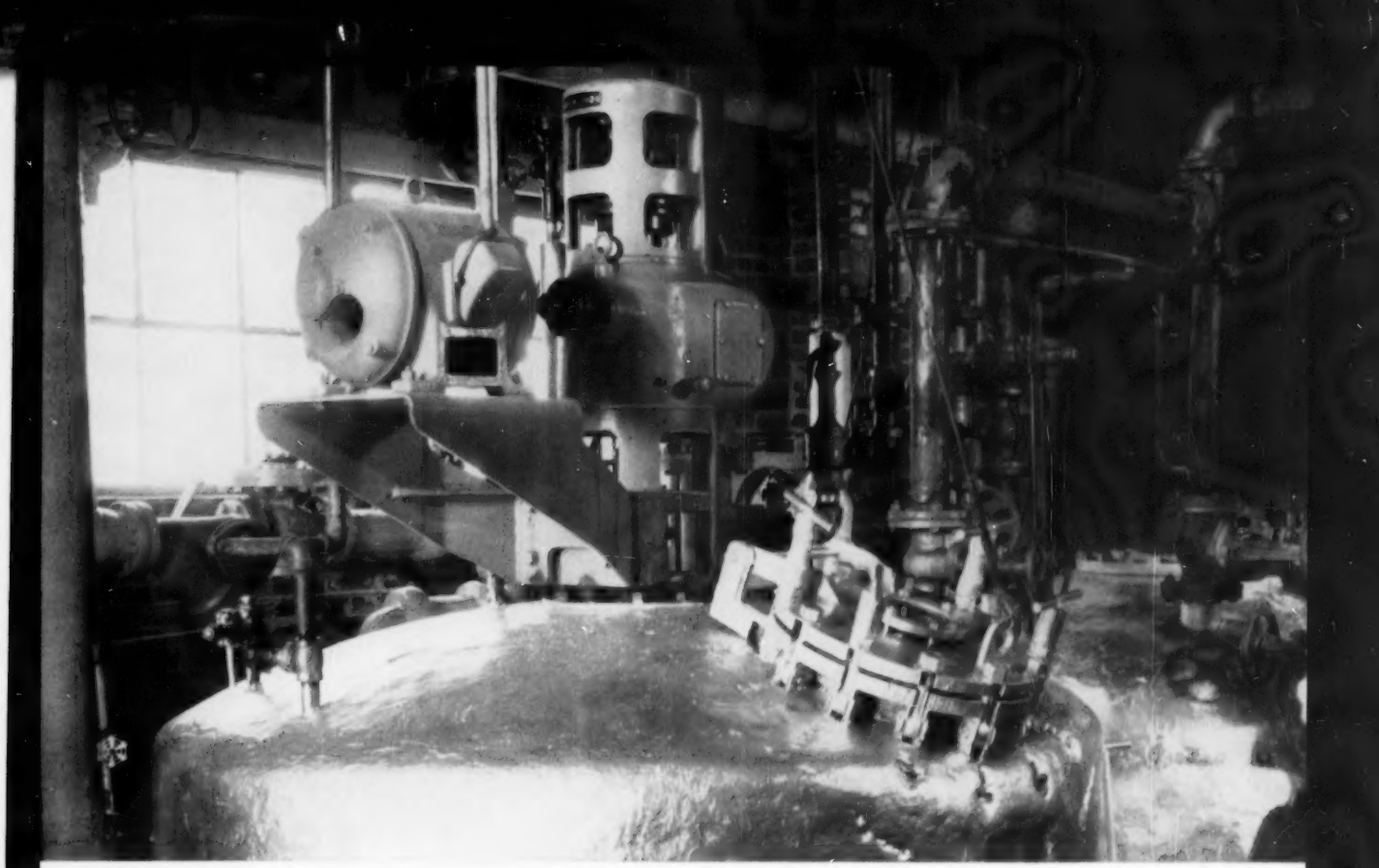
Yet it is about as big as it can be without more men to carry on increased research and development!

Which brings to mind again an idea by Prof. G. E. Livingston, University of Massachusetts. It is to produce a short film that can awaken high school seniors to opportunities in the food field.

Some benefit should come from a new color movie financed by National Canners Association for potential TV showing. This covers canning processes and research, along with growing and harvesting. And NCA is to be complimented for taking this step to do a much needed educational job for its field.

There is the possibility that half the people in the country will see the film in the next few years!

This should inspire some overall-industry group to produce a film serving the entire food industry. If not, then it should scare them into making such a film. Otherwise, the canners will reap the rewards at the expense of other branches of the industry.



How to keep **25,000 lbs. of product** *from burning up*

How can you assure even cooking, without burning, in batches as big as 25,000 lbs.? Here's how one company does it with a LIGHTNIN Mixer:

Sethness Products Co., Chicago, makes high-quality caramel from sugar, in the big pressure kettle you see here. The sugar must be stirred constantly, while temperature rises and holds steady above 250°F for several hours, then quickly drops to 200°F. Good temperature control is vital.

What the mixer does

To meet the critical stirring requirements, Sethness uses a Series "E" LIGHTNIN Mixer with stainless shaft and turbines. The mixer creates a rapid, uniform flow of sugar throughout the kettle. It keeps temperature equalized, so sugar caramelizes uniformly. And it provides high coefficient of heat transfer, so temperature changes in the vessel jacket are transmitted quickly and evenly through the batch.

You can meet the most exacting fluid mixing requirements—in any batch size, any tank or container—with LIGHTNIN Mixers. You get the *one* correct mixing pattern that exactly meets your needs—selected scientifically from many hundreds of standard power-speed combinations. Results are guaranteed, unconditionally.

Lower mixing costs

You save on installation and maintenance, too. Every LIGHTNIN Mixer comes to you assembled and aligned, ready to operate. Most models are easily converted to meet process changes, as they occur. Hundreds of LIGHTNINs have been in service 20 years and more.

For quick, competent help on mixing that does what you want it to do, call in your LIGHTNIN Mixer representative today. Or write us direct.

Lightnin® Mixers

MIXCO fluid mixing specialists

MAKE ANY OPEN TANK an efficient mixing vessel, by adding a LIGHTNIN Portable Mixer. Thirty models; wide choice of motors and materials to match your conditions.

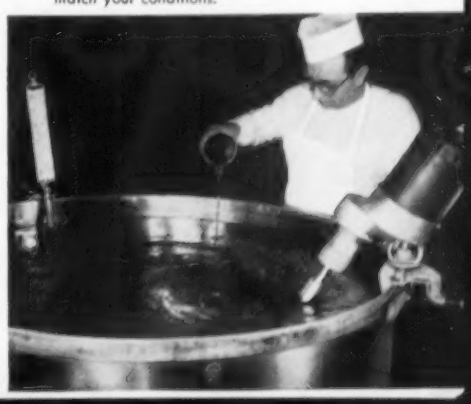
FOR LATEST MIXING INFORMATION and full description of LIGHTNIN Mixers, send for these helpful bulletins:

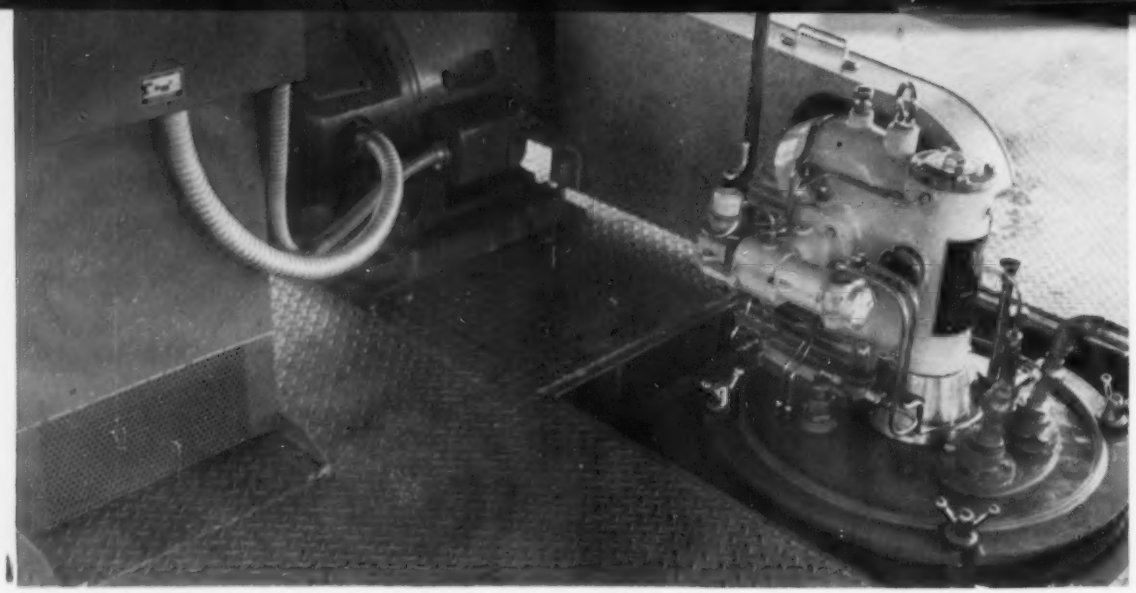
- ☐ B-102 Top or bottom entering; turbine, paddle, and propeller types: 1 to 500 HP
- ☐ B-103 Top entering; propeller types: ¼ to 3 HP
- ☐ B-108 Portable: ⅛ to 3 HP
- ☐ B-104 Side entering: 1 to 25 HP
- ☐ B-112 Laboratory and small-batch production types
- ☐ B-109 Condensed catalog showing all types
- ☐ B-111 Quick-change rotary mechanical seals for pressure and vacuum mixing
- ☐ B-107 Data sheet for figuring mixer requirements

Check, clip, and mail with your name, title, company address to:

MIXING EQUIPMENT Co., Inc. 143-b Mt. Read Blvd., Rochester 11, N. Y.

In Canada: Greey Mixing Equipment, Ltd., Toronto 10, Ont.





1 CENTRIFUGAL ATOMIZER, geared up to 5,000 rpm., is protected from hot dryer air by forced lubrication system. It is driven by 15 hp. motor through V-belts and step-up gearing.

Stable Powdered Flavors Now Spray Dried

Engineering innovations in new continuous process assure peak yield of uniform high quality flavors with minimum labor requirements

IN the manufacture of flavors in powder form for incorporation in fruit drinks, prepared mixes, icings and similar products, a special application of spray drying has proved very efficient at the new Boonton, N. J., plant of Norda, Inc.

Here are important steps of the process.

After flavor ingredients are compounded in predetermined ratio, the flavor-liquid is emulsified with gum arabic, delivered to the process at the rate of 1,265 lb. per hr. and held temperature controlled in a mechanically agitated

For the story behind the Flowsheet, see p. 76.

stainless steel jacketed vessel. From the latter the emulsion is pumped at instrument controlled rate to the Nerco—Niro centrifugal atomizer (1) in the dome of the three-floor high dryer (2).

Air, electrically heated in a three-stage unit (3) to 450 deg. F., is carried by duct into the dryer near its bottom; thence up to within a foot of the spray nozzle (5). Rotary contact of the 5,000 cu. ft. per min. hot-air blast with the flavor mist evaporates in split-second time the moisture content of the emulsion, thereby sealing the flavor honeycomb fashion in particles averaging 150 microns in size.

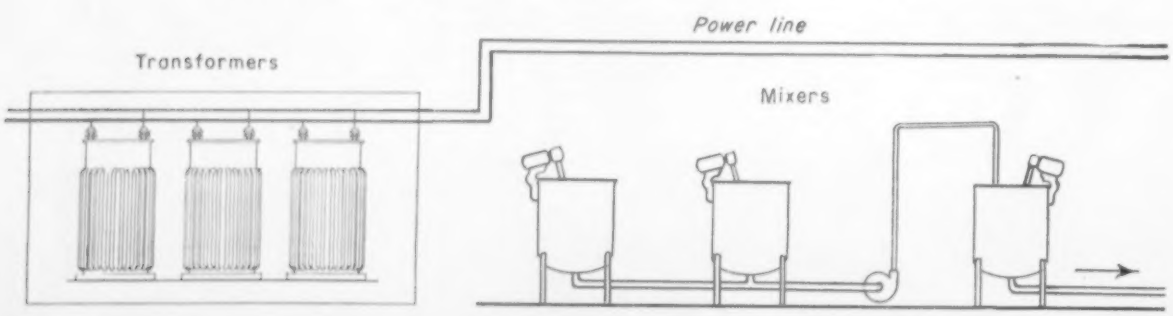
Despite the 450 deg. F. temperature of the drying air, the loss of volatile flavor-ingredients is held to less than 5%.

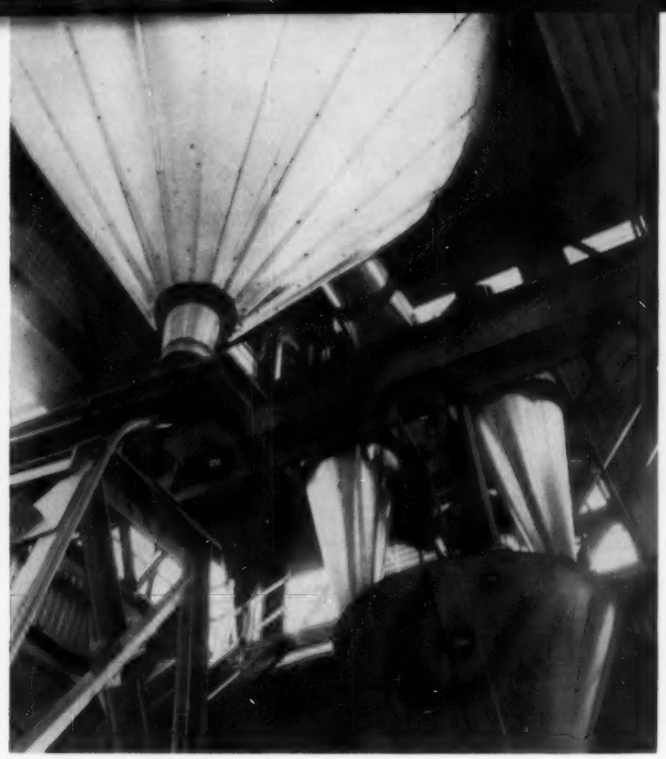
Exit temperature of the air from the dryer is 210-220 deg. F.—exit temperature of product is approximately 150 deg. F. The latter is cooled by countercurrent of room temperature air in the closed vibrating conveyor (6) which delivers the product to a gyratory screen (7) for removal of oversize particles. Dust and fines are recovered in three cyclones (8), which are exhausted by blower (9) to the atmosphere.

The capacity of the plant is approximately 375 lb. of finished dry flavor powder per hour and 90 lb. of fines which are reprocessed. Production of the 465 lb. of product requires the evaporation of 800 lb. of water per hr.

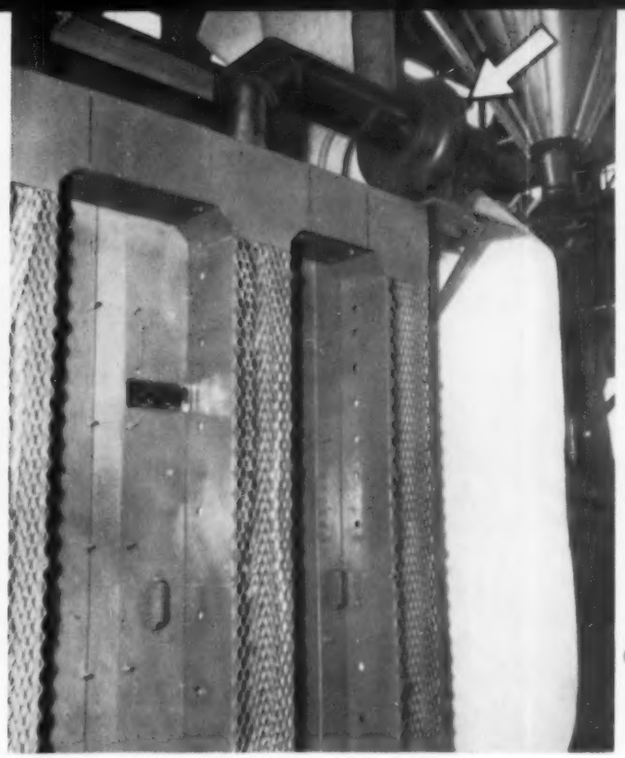
The process, which is instrument controlled and recorded, has minimum labor requirements.

FOOD ENGINEERING February 1956 Pages 102-105



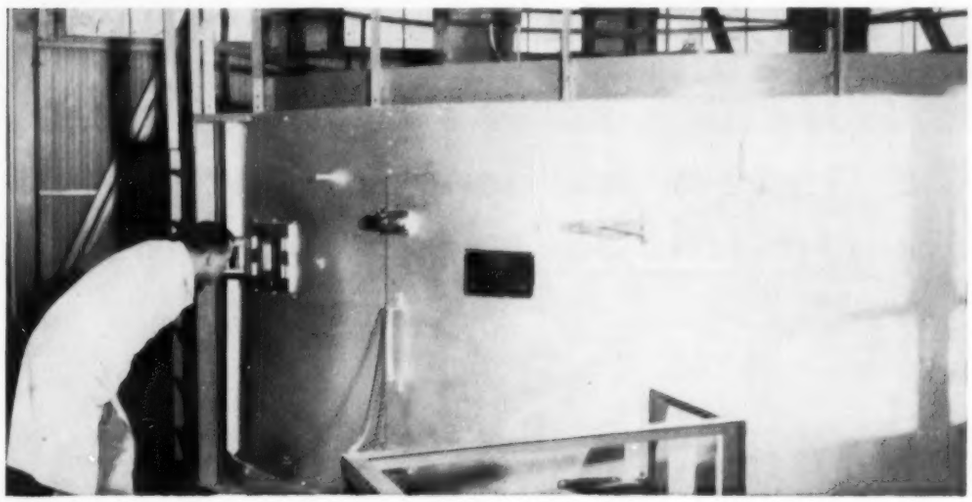


2 DRYER, built of stainless, is entirely insulated. Discharge of dried product is continuous.

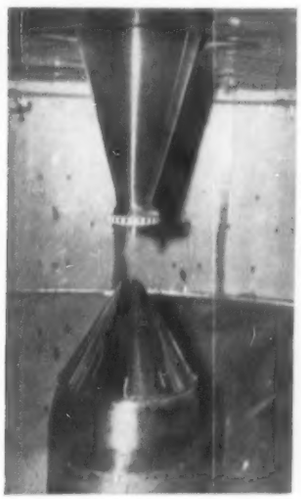


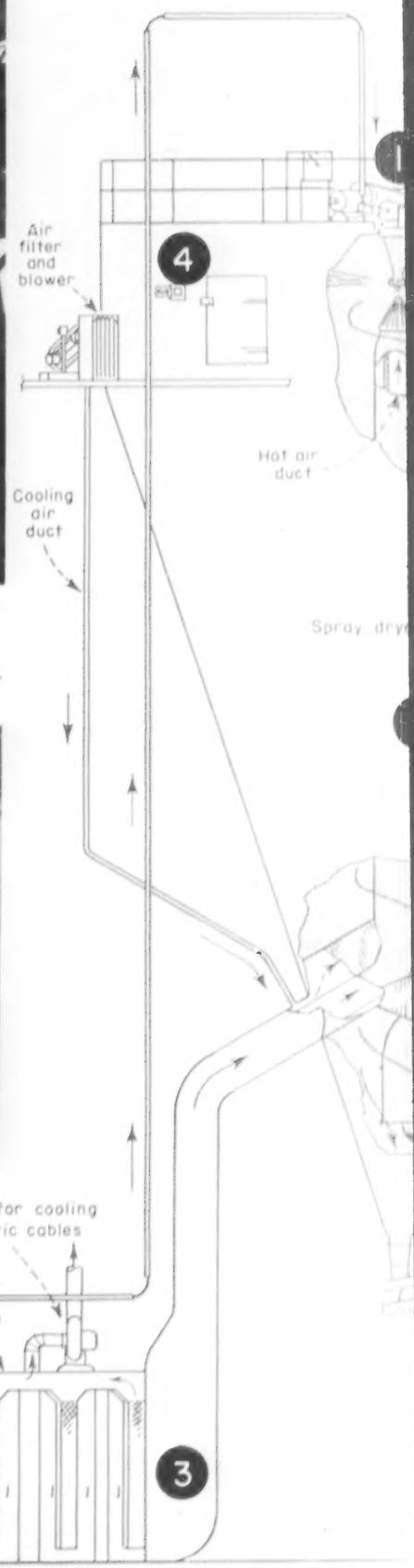
3 AIR HEATER CABLES are cooled by blower (see arrow). The blower exhausts hot air to atmosphere.

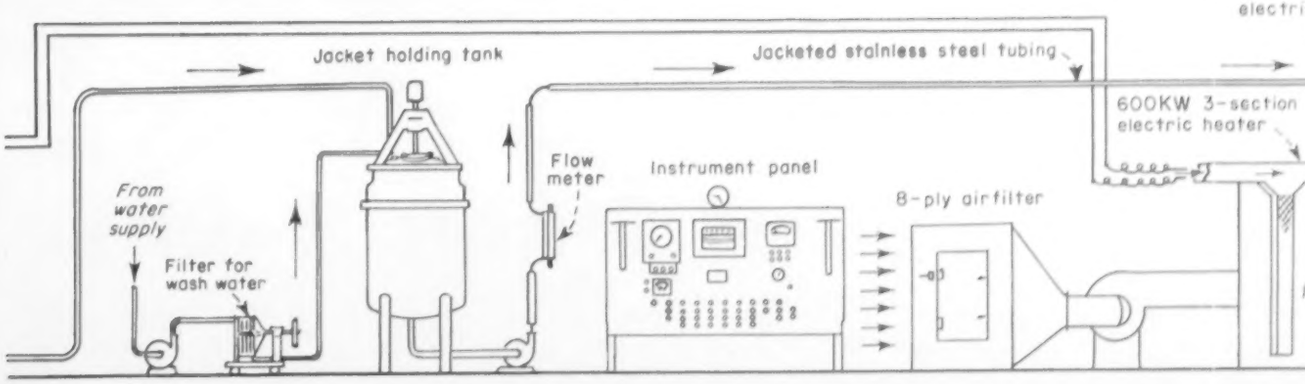
4 WINDOW in 18 ft. diameter, 3-floor high dryer permits operator to view drying in lighted interior. Dryer proper is entirely constructed of stainless steel.



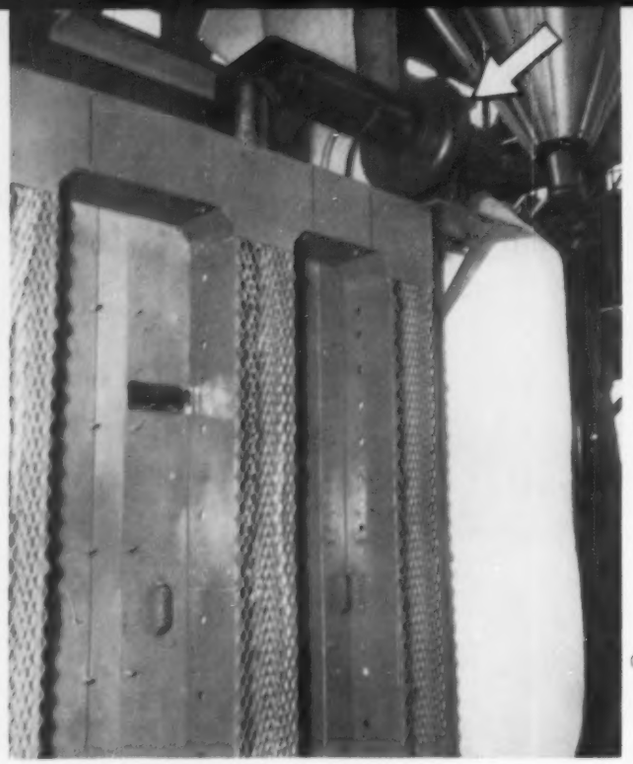
5 ATOMIZER and hot air duct outlet below it.







ainless, is entirely insulated. Discharge of dried
ous.



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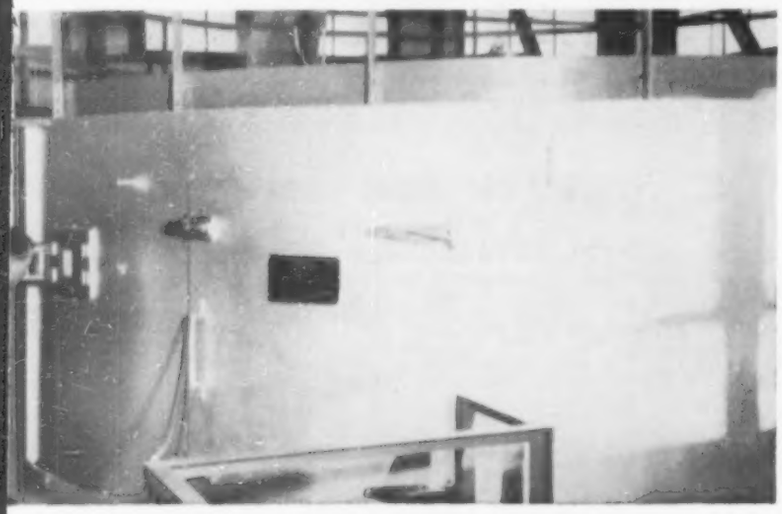
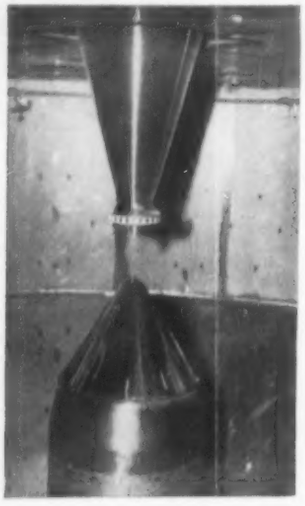
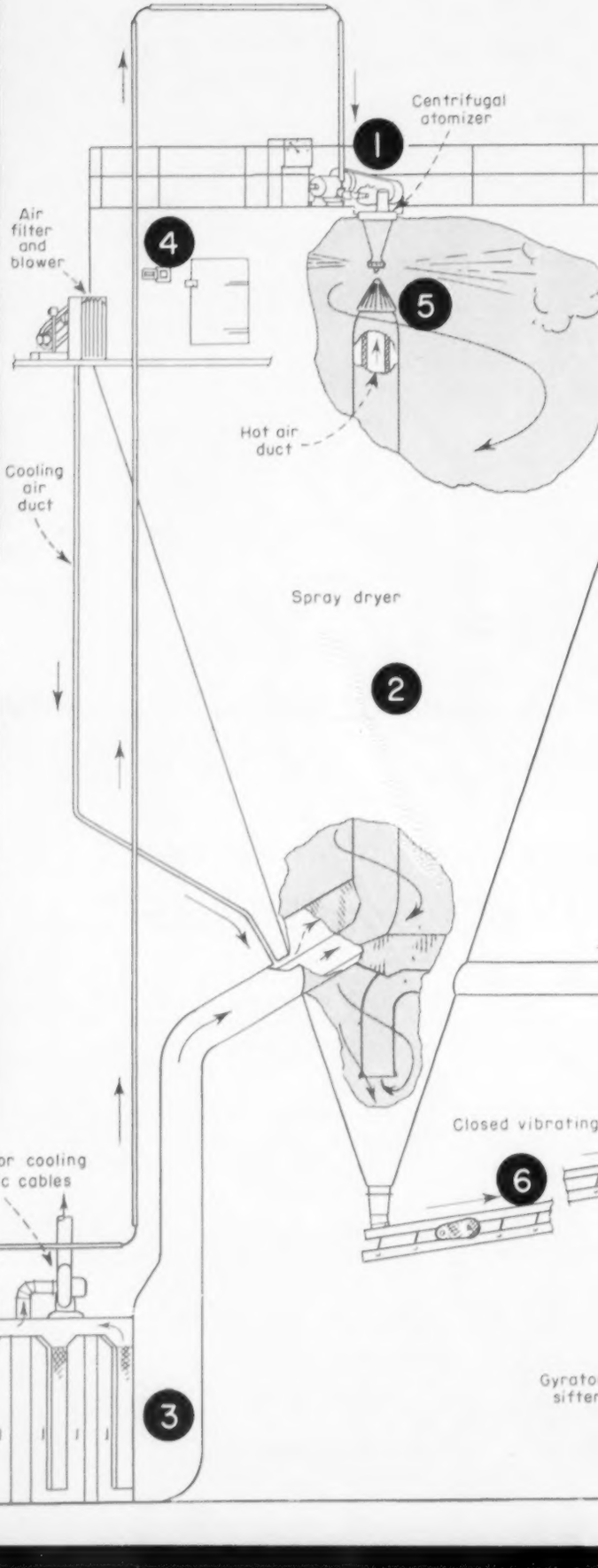
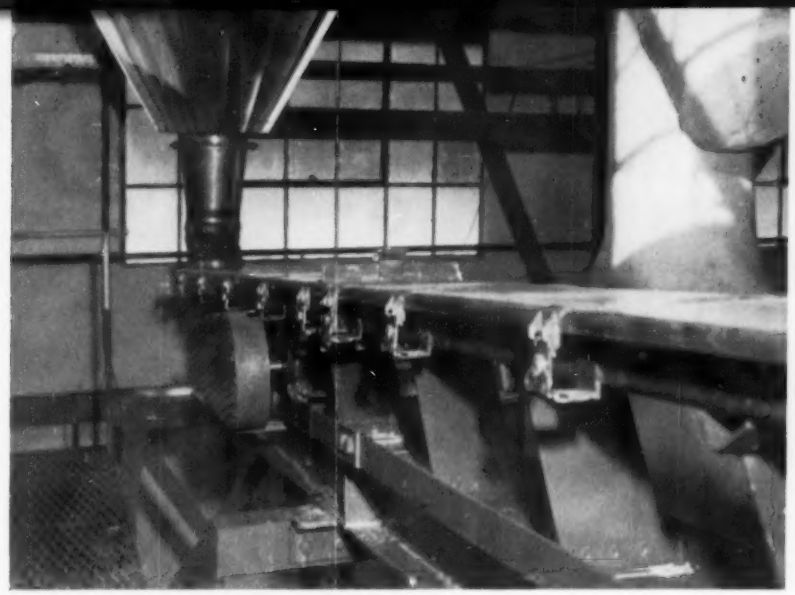


5 ATOMIZER and hot air duct outlet below it.

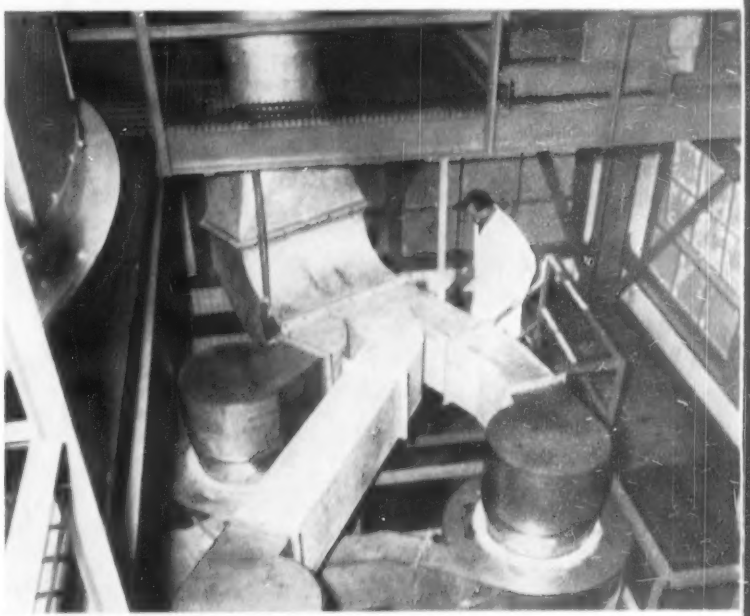






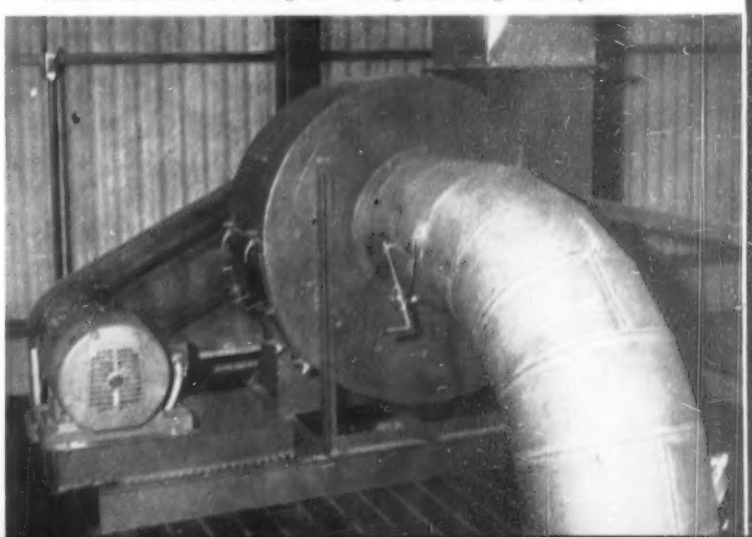
6 **VIBRATING CONVEYOR,** closed type, in which product, entering at 150-160 deg. F., is cooled to 90 deg. in transit.

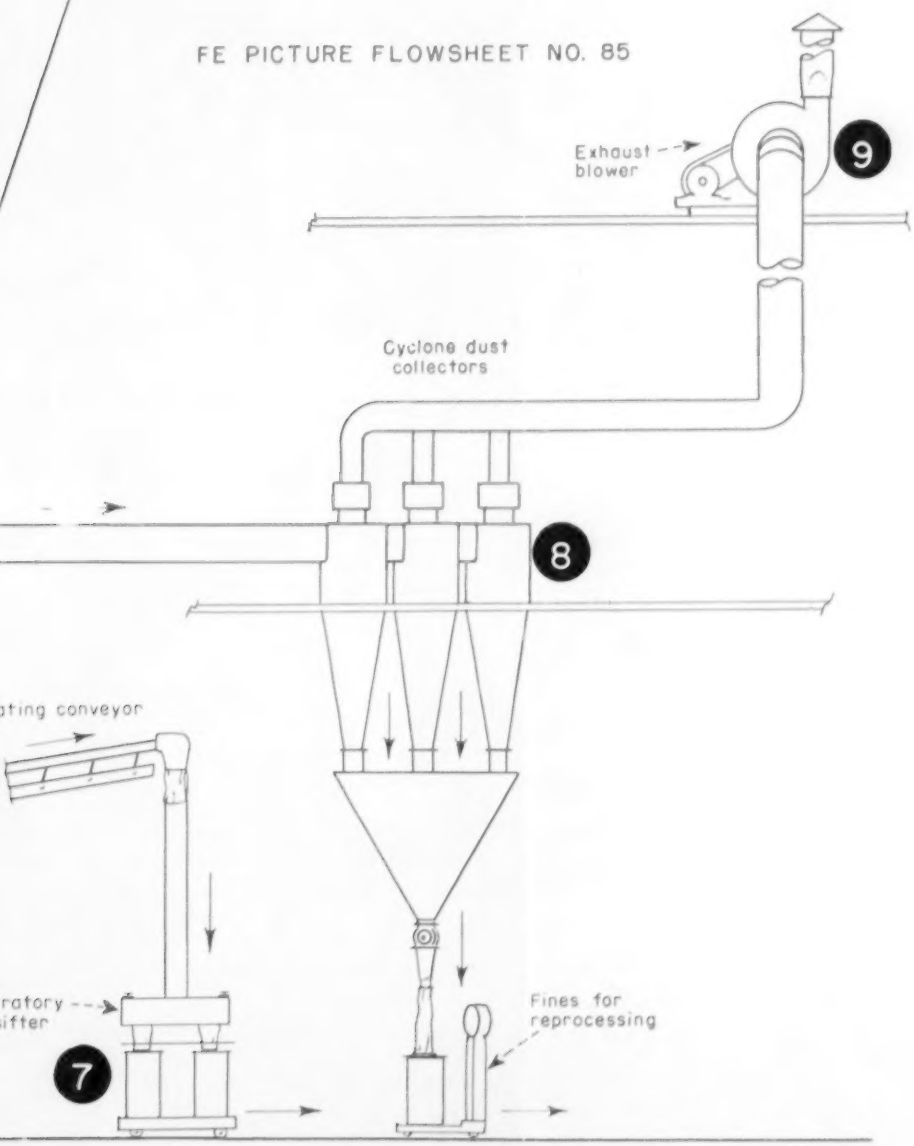
7 **GYRATORY SIFTER** removes negligible oversize before packaging of product in polyethylene-lined fiber drums.



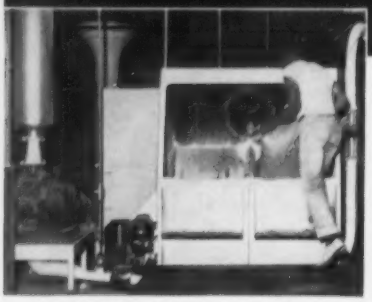
8 **CYCLONE SEPARATORS** of all stainless construction collect dust and fines, which are reprocessed.

9 **BLOWER** which exhausts cyclones also maintains slight dryer vacuum and draws cooling air through discharge conveyor.

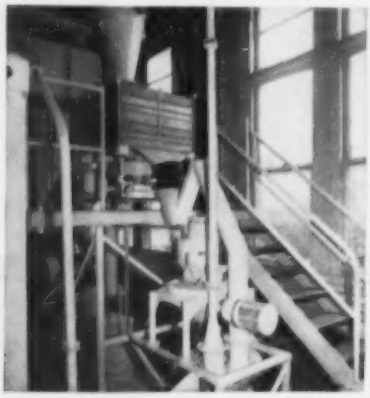




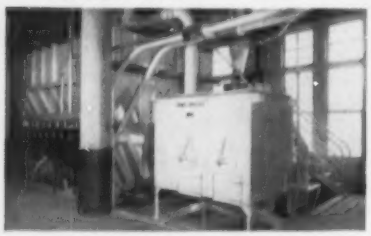
Picture Story of MODERN FLOUR HANDLING with The AIRVEYOR®



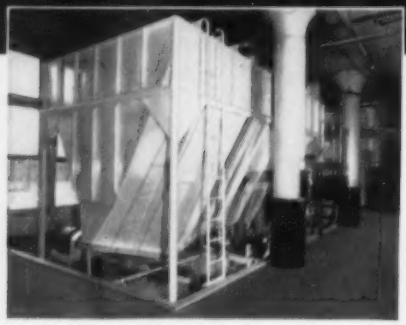
1 Incoming flour is emptied into bag-dump hopper from which it feeds through an airlock into a pneumatic line for delivery to storage. Blower is shown at left.



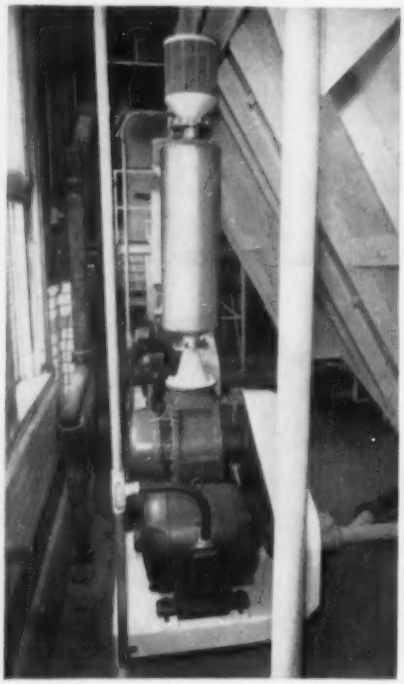
2 Before going to storage, flour is delivered via a cyclone (top) into sifter and to an entoleter (bottom). Cyclone exhaust goes to dust collector.



3 Eighty-thousand-pound capacity storage bin of the Airslide type. Dust collector in foreground filters the exhaust airstream to insure the complete retention of all flour particles.

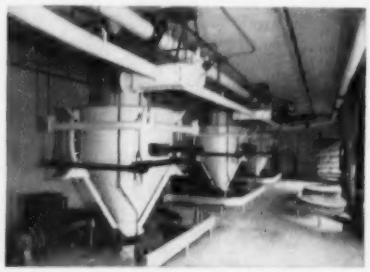


4 Opposite view of storage bin. Bin has two drainage points, each of which services three dough mixers. Airslide duct beneath bins flows flour into airlock outlet valve.

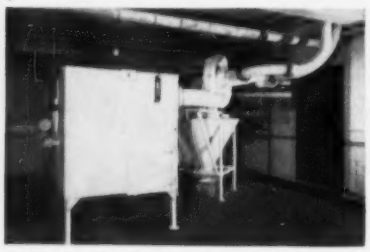


5 Positive-pressure blower serves each storage bin section; provides airstream for conveying flour from bin to dough mixers. Airlock by-pass enables system to finish weighing a batch with a dribble stream for greater accuracy.

6 Motor for operating rotary airlock (front), and blowers for supplying air to Airslide bin-bottoms (center).



7 Three weigh-hoppers, each located above a dough mixer, and fed by pipe line from storage bin.



8 Dust collector through which air from weigh-hoppers is filtered. Cone-shaped hopper collects flour for "dusting" purposes.

Just as the large Eastern bakery shown has found pneumatic handling of flour so completely satisfactory, you also will find the Airveyor engineered and installed by Fuller far superior to other systems. Why not write for details as they apply to your requirements?

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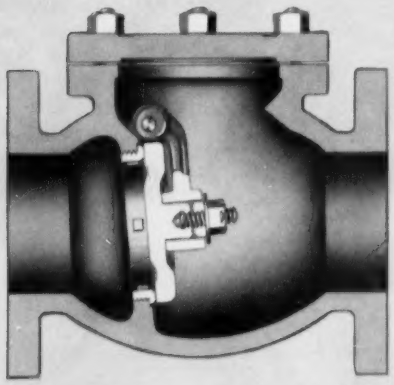
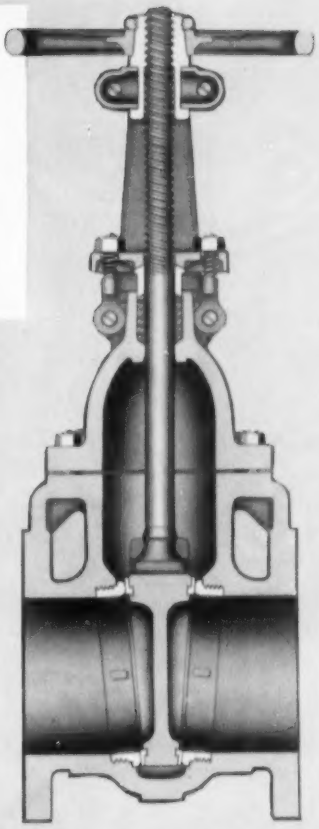
14 in. and larger—150 psi W.O.G.



Cross section, Check, No. 14493
Flanged ends



Cross section, Gate, No. 14477
Flanged ends

Crane Nickel Cast Iron Valves
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Why wait for low nickel alloy cast iron valves when you can get Crane quality—at no extra cost—immediately from factory stocks? Gates on hand in sizes: 2″—2½″—3″—4″—6″—8″—10″—12″—14″—16″—18″. Checks in all the same sizes up to 12″ incl. (14″—16″—18″ will be made to order). This delivery offer good while present stocks last.

These valves have an outstanding record in the pulp and paper industry in handling various alkaline liquors. In wood treating they're used successfully on creosote vapors and oils. They're ideal, in the petroleum industry, for handling oils containing traces of mineral acids.

Crane 18-8 SMo alloy trim in these valves combines with nickel alloy body to assure tight seating and smooth, maintenance-free operation. The gates have Crane features such as: full-length disc guides . . . 2-piece ball-type gland . . . and flexible T-head disc-stem connection.

The checks feature all 18-8 SMo trim, including body ring, disc, hinge and hinge pin in sizes 2 to 12 inches. Valves 14 inches and larger have disc same as body, with 18-8 SMo disc faces.

You'll save with these valves, both on original cost and maintenance—and you can get them immediately! Call your local Crane Representative today.

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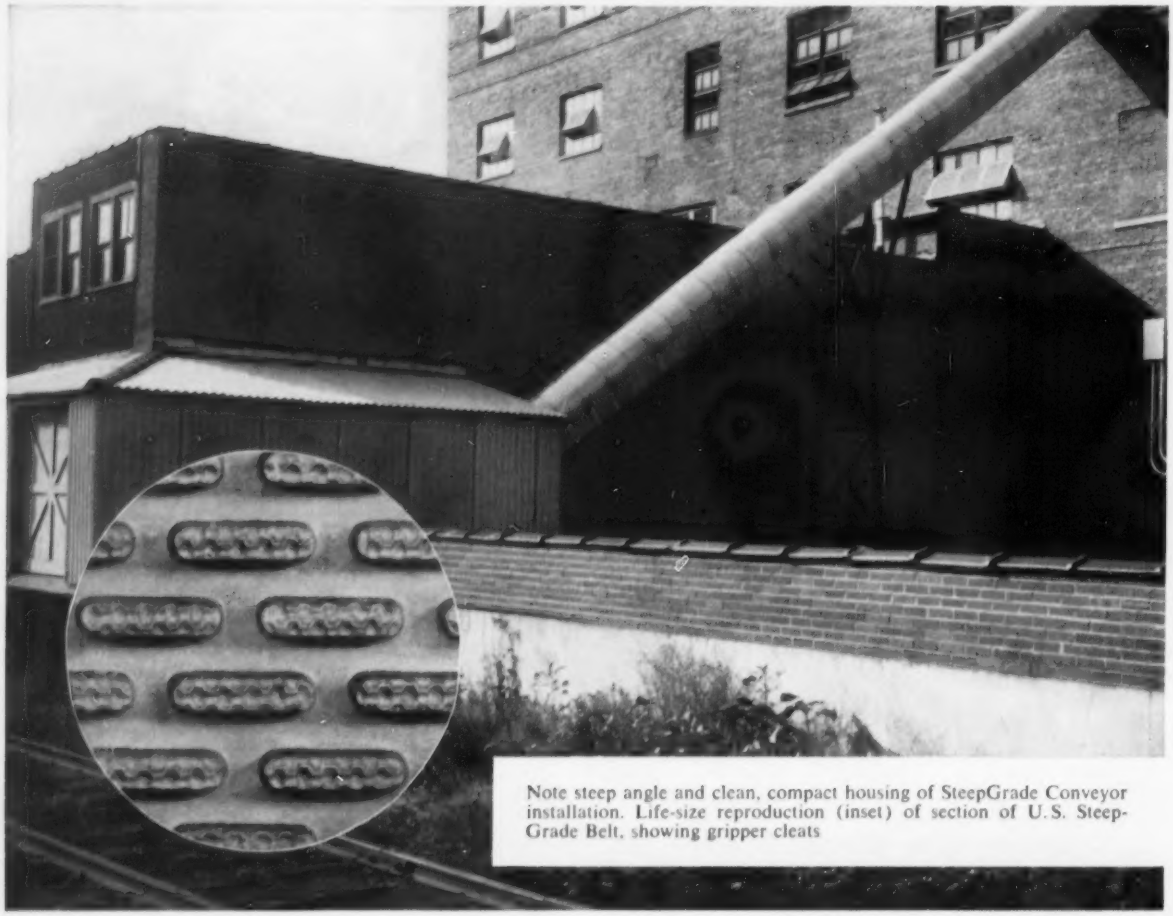
NOT A SLIDE THAT SLIPS...BUT A BELT THAT GRIPS



Note steep angle and clean, compact housing of SteepGrade Conveyor installation. Life-size reproduction (inset) of section of U.S. SteepGrade Belt, showing gripper cleats

U. S. STEEPGRADE conveyor belt with exclusive gripper-cleat construction

When officials of a large Mid-Western packing plant decided to build a plant for the production of dry dog food, they ran into a problem:

Their engineers had decided that the raw materials (in bags weighing 100 lbs. each) could best be processed at the top floor of the plant. But this required a conveyor belt from the railroad siding to the top floor that would carry the materials at an angle of 35 degrees. Any lesser angle would have meant cutting the belt through the lower floors of the building—entailing expensive construction charges.

United States Rubber Company engineers came through with the answer. On their recommendation, a U. S. SteepGrade Belt was installed. Its unique *gripper-cleat* design easily gripped heavy bags and provided positive ascent.

With U. S. SteepGrade there are no "avalanches" at critical angles, even up to 45 degrees with some materials! Its ability to work at steep inclines saves valuable floor space, conveyor length and belt footage. Special molding process makes belt and cleats one unit; this *exclusive* feature prevents gripper cleats from being torn off by heavy cases. Surface design incorporates self-cleaning action as belt flexes over pulleys—cleans as it flexes.

Get in touch with any of the 27 "U.S." District Sales Offices or write Rockefeller Center, New York 20, N. Y.

Mechanical Goods Division

United States Rubber

After the Great Ford Foundation Gift . . .

What Still Remains To Be Done To Provide Decent Faculty Pay

The Ford Foundation's gift of a half billion dollars to our privately supported colleges, medical schools and hospitals, now being distributed, is magnificent. But it will be much more magnificent if it inspires completion of the job to which it gives a lift. So far as the colleges and universities are concerned, this job is primarily to rescue their faculty members from being second-class citizens economically.

Even in a period when we have become accustomed to astronomical financial figures, a half billion dollars remains an eye-popping gift. In fact, it is so imposing that a good many people who don't read the fine print are apt to conclude that it must just about solve the financial problem to which it is addressed.

Goes Only a Small Way

However, we have allowed college professors to fall so far behind the parade financially that the share of the Ford half billion dollar gift going directly to the improvement of faculty salaries ($210 million) will go only a small way financially toward doing what is necessary to provide adequate salaries.

Completion of this job for our privately supported colleges and universities calls for:

1. An increase in faculty salaries at least five times as great as that made possible by the Ford gift merely to restore salaries to their 1939 purchasing power level and an increase fifteen times as great to provide adequate salaries today.

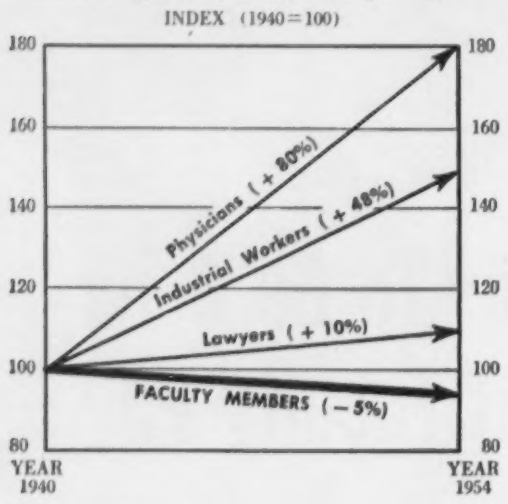
2. Some difficult and courageous decisions by the heads of the colleges and universities in apportioning the grants received by them.

Terms of Gifts to Colleges

The $210 million of the Ford Foundation gift going specifically to improve faculty salaries is being distributed on the following basis: Each of 615 privately supported, regionally accredited liberal arts and science colleges and universities receives a gift about equivalent to its last year's teaching payroll. For ten years only the income from these gifts is to be devoted to raising faculty salaries. After that all the money can be spent in any way the institutions receiving it see fit. There is no requirement that universities having other than liberal arts and science schools limit use of the gifts to improving salaries in these schools alone. They can spread it right through all their faculties if they wish.

In addition to the gift of $210 million specifically directed to increasing faculty salaries, another gift of $50 million goes to a group of 126 institutions selected for specially noteworthy leadership in improving

What's Happened to College Faculty Salaries*



* Real Income before Taxes.

Source: Council for Financial Aid to Education, U. S. Dep't of Commerce: U. S. Dep't of Labor.

the status and pay of teachers. For these schools the individual gifts add about 50% more to the amounts coming from the $210 million fund. They can be used to improve faculty salaries if the institutions choose to do so, but this is not required by the terms of these gifts.

The $210 million plus the $50 million should yield an income of $10-$13 million a year. Even if all this is used to raise salaries, it will be only a small step, however worthy, toward the $200 million per year the colleges need to meet their salary requirements adequately.

Helps Some Who Need It Most

In focussing its gift to improve faculty salaries in privately supported liberal arts and science colleges, the Ford Foundation aims at least part of the help at the spot where it is most desperately needed. Numerous surveys have indicated that the most poorly paid of all college and university faculty members are those in small, privately endowed liberal arts colleges.

But the overshadowing fact is that the teachers in our colleges and universities as a whole are badly underpaid. Just how badly is indicated by the chart above which first appeared in an earlier editorial. (Figures later than those for 1954 are not available.)

The Ford gift will turn the indicator of faculty salaries, which now lies far below the general salary trend, upward a few points. And it will do this in some places where salaries are below the wretched average shown by the chart.

But the Crucial Test Remains

College and university administrators will have the opportunity to extend further the process of getting the help provided by the Ford Foundation gifts where it is most needed. In general, this will mean giving it to senior faculty members, in order to hold experienced teachers and make college teaching attractive as a career. But to make such a division in many schools will take extraordinary fortitude.

The crucial test of the success of the enterprise of the Ford Foundation in raising faculty salaries will lie in whether it prompts the rest of us — college alumni, individuals, business firms and legislators alike — to see that it is a great beginning, not a signal for a recess.

Even with the Ford gifts providing $10-13 million a year, our privately supported colleges and universities must have an increase of about $190 million a year to provide decent faculty salaries.

This is a job far beyond the capacity of the Ford Foundation, imposing though that is. It is a job far beyond the capacities of a few hundred large corporations and a few thousand wealthy individuals. If it is to be done, it is a job at which all of us must work with a will.

This message is one of a series prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nationwide developments that are of particular concern to the business and professional community served by our industrial and technical publications.

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Donald C. McGraw

PRESIDENT

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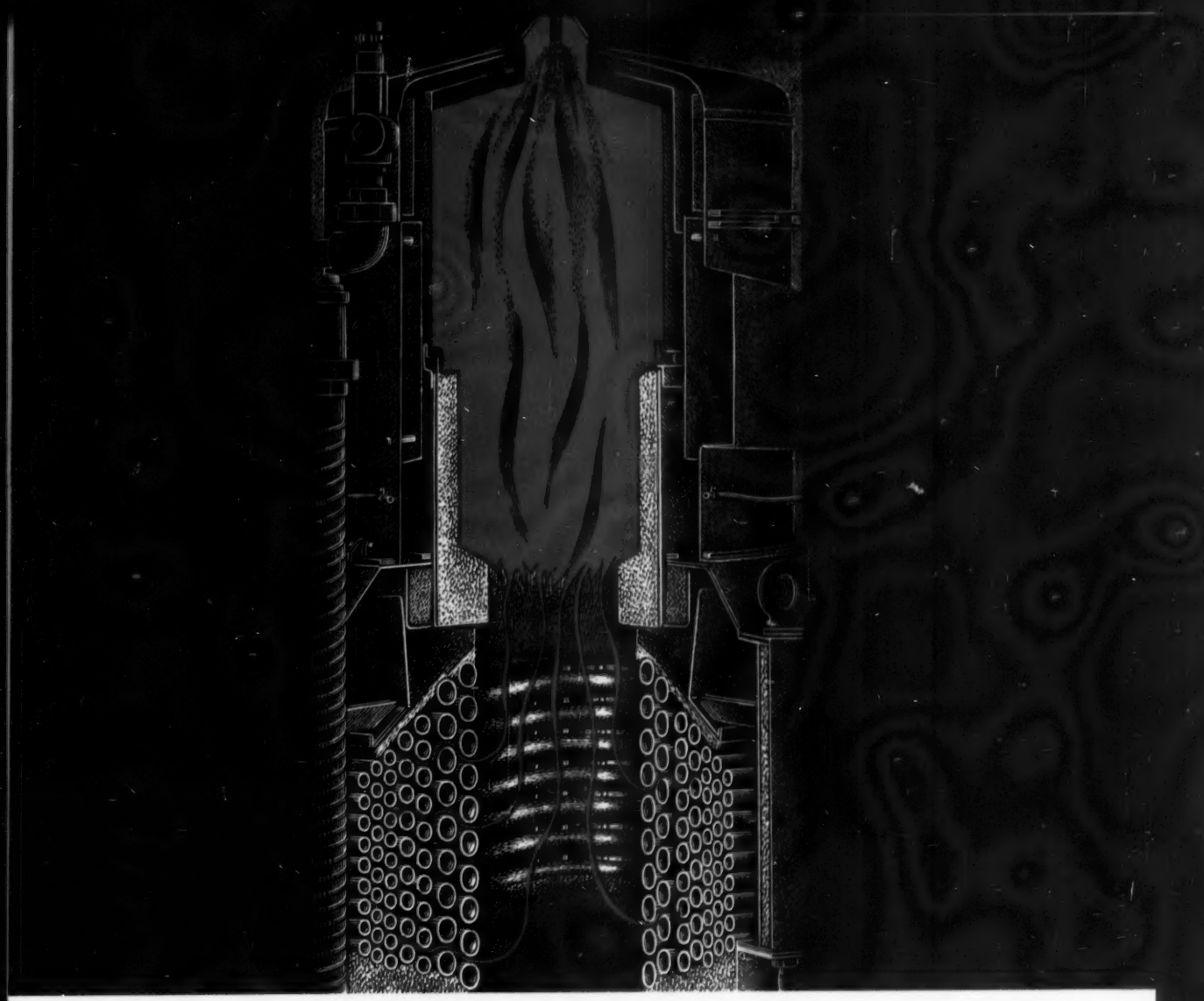
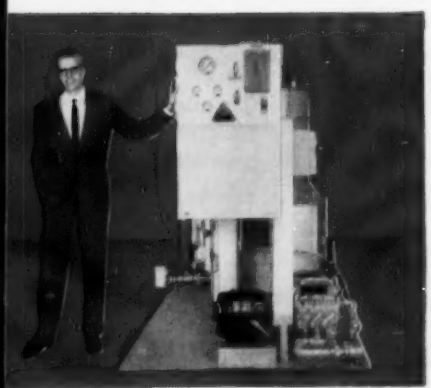


more steam, faster steam in less space



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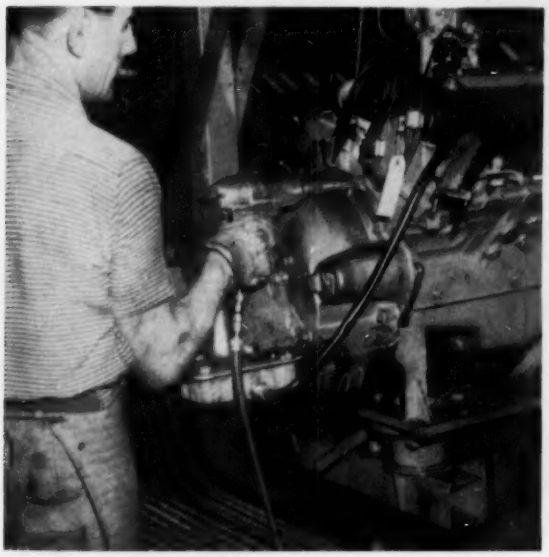
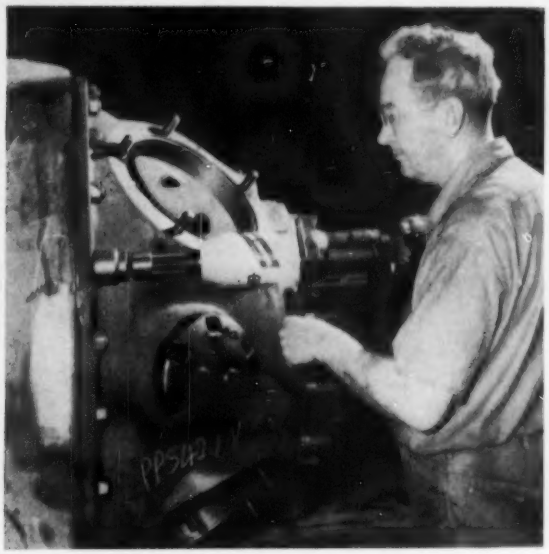
NEW EQUIPMENT & SUPPLIES





Novel Impact Air Tools Control Nut-Running Torque

Seen speeding the bolting of steel construction, and cutting its cost, is a new air-operated tool that combines impact nut-running with torque control.

Called "Torque Control Impactool", it precisely impacts the nut to a preset torque, then automatically shuts itself off. Since unit's action does not depend on operator's sense of timing, tool can be used accurately by unskilled workers. All that is necessary is to set the device and pull the trigger.

Unit is available in two sizes (see photos).

Left: 5040T unit for use in general industry, since it is relatively small and easily handled. Two torsion bars offer maximum torques of 60 and 90 lb.-ft.

Right: 5340T model for heavier duty. It is factory preset at 320 lb.-ft., but can easily be adjusted to a maximum of 550 lb.-ft.

In operating with the torsion-bar principle, tool runs at normal power and speed while nut is being tightened to required torque. But when nut-running resistance equals the stress preset in torsion bar, impact mechanism rebounds instantly and trips a rubber-faced shut-off valve.

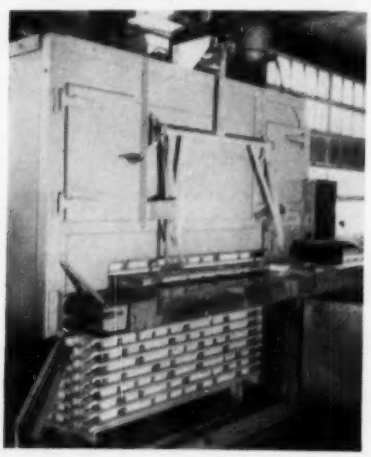
Torque may be set easily and quickly. Employed is a jig which turns the torsion bar and calibration collar against rigid splines on the torque-bar adjusting sleeve. A setting reportedly takes only a few seconds.

Once fixed, torque setting remains constant for any nut-running operation until the adjustment is changed. Releasing the trigger automatically resets the tool to the same torque for the next run.

Pressure regulators are not needed since unit operates at full power and speed. With wide-open throttle operators can run nuts quickly, yet "overtorque" is eliminated through automatic shut-off. Operation is reversible with full power in either direction.

Furthermore, maintenance is low since there is no clutch to require adjustment.—*Ingersoll-Rand, 11 Broadway, New York City 4.*

Circle 113A on Reader Service Card



Automatic Plate Freezer Cuts Production Costs

Designed to meet demand for economical production of flat, well-formed frozen packages, which stack compactly in retail cabinets, is a new mobile double pressure-plate freezer. Unit's operation eliminates manual labor.

Called Portable, it is the key to a continuous-automatic loading, freezing, and unloading system that offers top efficiency. Insulated freezers are available with 15 to 20 stations per unit, which can be incorporated into any variable floor plan since there is no built-in construction. Per machine, required headroom is about 13 ft., floor space about 7x10 ft.

In operation, packages are fed by conveyor from an overwrap machine, then loaded into the freezer by an automatic hydraulic pusher. Double-contact freezing (top and bottom) starts as soon as one station is loaded. Hydraulic pressure is applied when the freezer is full.

After freezing, each station is consecutively unloaded at the rear, while being reloaded at the front. Unit can be stopped at any point along the line, and there is a front control panel which regulates feed and discharge rate.—*Amerio Contact Plate Freezers, Inc., 128-36 44th St., Union City, N. J.*

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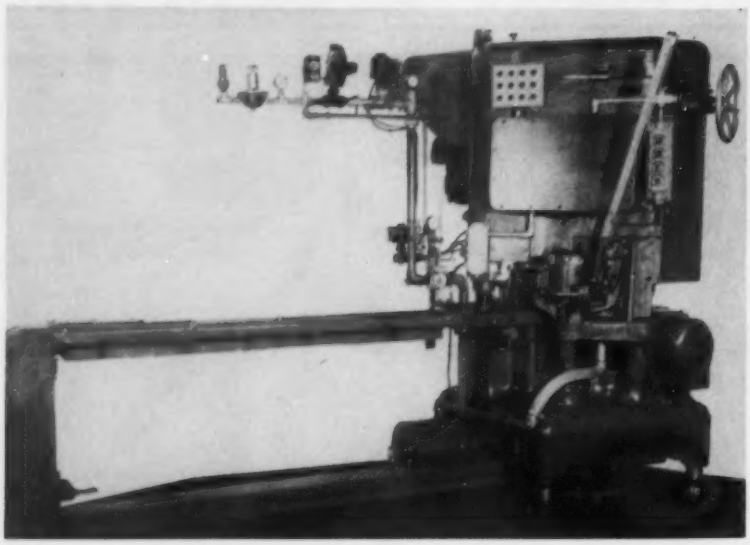

Double Seamer Closes Pop Cans At 1,000 Per Min.

Shown above is one of three new machines designed to meet high-speed closing requirements of carbonated beverages.

This unit (212-8RG) has a capacity of up to 1,000 cans per min. It is a self-contained can-revolve closer for double-seaming of round cans. Eight seamers are in a revolving cage.

Readily arranged for close hook-up to most fillers, it provides smooth can transfer. Change parts that can easily be removed and replaced accommodate cans ranging from 202 to 211 in diameter and 211 to 604 in height. Net weight is 8,880 lb., required floor space is 44 x 46 in.

Other equipment includes:

A 350-per-min. unit (410-4RG) with four seamers handling cans from 202 to 404 in diameter and 2¾ to 7½ in. tall. Weight: 4,550 lb.; floor space, 44 x 119 in.

A 550-per-min. machine (411-6R2-G) with six seamers closing cans from 202 to 404 in diameter and 214 to 708 in height. Weight: 7,200 lb.; floor space 45 x 92 in.—*American Can Co. 230 Park Ave., New York City* 17.

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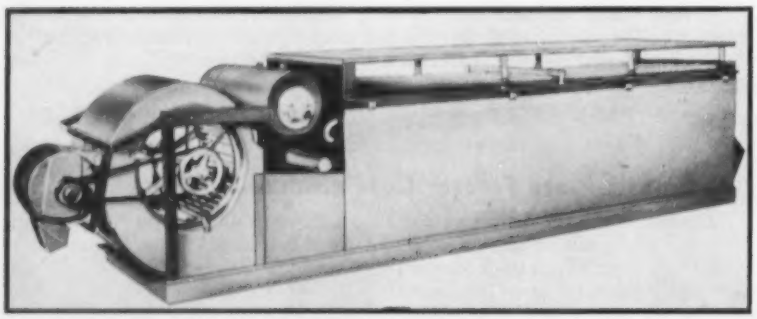

Efficient Space Cooler Saves Floor Space

Delivering 3,500 cu. ft. of refrigerated air per min., this 4-ton space cooler is offered for rapid chilling of products such as meat and poultry. Furthermore, it is designed for even distribution of air throughout the refrigerated area, fits between meat rails, and occupies otherwise unused ceiling space.

Known as Chilljet, unit consists of housing, cooling coil, fan, motor, and drive. For maximum efficiency, the coil is kept flooded by a built-in surge drum with liquid-level control. Coil can also be furnished for thermal-valve operation or for liquid recirculation. Defrosting is by hot gas.

A 1-hp. motor powers the 16-in-dia. double-inlet blower wheel, which turns at 600 rpm. for efficient use of current and quiet operation. Also provided is a double drip pan tightly joined by 1 in. of sealed cork insulation. No cork is exposed and seal prevents entry of moisture.

Cleaning and inspection are simplified by removable side panels which are held by four thumb screws.—*Industrial Manufacturing & Engineering Co., 3033 W. Belmont Ave., Chicago* 18.

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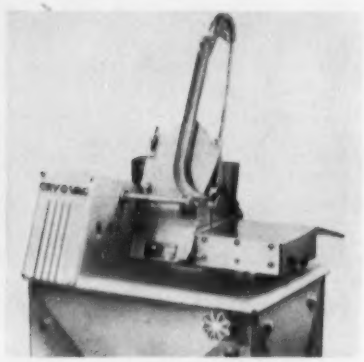


Meats Vacuum Packaged By Fast, Automatic Unit

Small and medium-size meat cuts may rapidly be vacuum-packaged by a new automatic unit (Model HT-F) that vacuum-seals products in plastic bags (Cryovac).

Vacuumizing, twisting, clip-applying, and trimming are accomplished in one operation. Adjustable product table and controlled vacuumizing time offer speed and uniformity, while pneumatic controls permit easy operations under wet conditions.

Machine is housed in a console, and all working surfaces are stainless steel. Unit, powered by ½-hp. motor operating on 115v. a.c., requires 40-lb. air pressure.—*Dewey & Almy Chemical Co., 62 Whittemore Ave., Cambridge 40, Mass.*

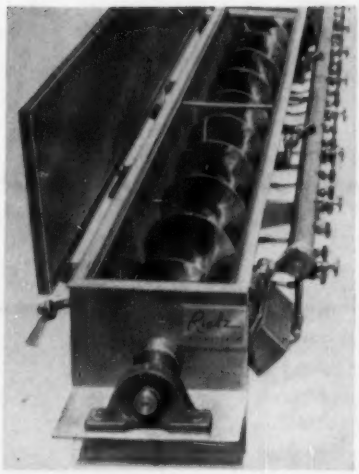
Circle 114C on Reader Service Card

Plastic Salt Dissolver Resists Corrosion

Salt dissolvers and brine storage tanks, made of polyester glass-reinforced plastic, are said to eliminate corrosion problems.

Since the plastic is translucent, true salt level is visible from any position around the tanks. And no painting is required.—*International Salt Co., Scranton, Pa.*

Circle 114D on Reader Service Card



Versatile Blancher Uses Low-Velocity Steam

Delicate foods that require blanching before canning may be processed without physical damage in this continuous steam or water blancher.

Known as Low-Pressure Steam Injection Thermascrew, it processes items such as onions, corn, mushrooms, and noodles through use of low-velocity steam. Latter is achieved by expansion valves with screen baffles that equalize velocity over the outlet area. Thus, volume of steam introduced can be accurately controlled without increasing the velocity.

Furthermore, all parts are readily accessible for cleaning when the hinged cover is opened.—*Rietz Mfg. Co., Santa Rosa, Calif.*

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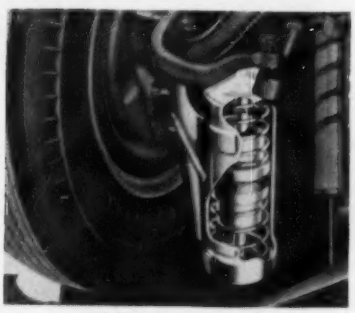

Driver Fatigue Reduced By New Shock Damper

Greater steering safety and riding comfort are reported advantages of new shock dampers for use on light trucks.

Mounted behind the front wheels, they counteract road jolts with "floating" weights that slide downward in metal cylinders. This tends to keep the wheels in contact with the road under severe driving conditions to give operator better control of his vehicle. Thus driver fatigue—an important safety factor—is cut as less wheel bounce and skidding enables steering with minimum effort.

Damper consists of an 11.8x4.4-in. cylinder containing a 12-lb. steel weight sandwiched between two coil springs. The weight slides along a steel rod running the length of the cylinder. Spring tension is adjusted so that vibration frequency (bounce) of the damper weight opposes that of the vehicle's front wheel.

When wheels bounce, the weight plunges downward to deaden vibration normally transmitted to the body. Thus, softer springs may be used for greater comfort. For maximum benefit, a damper is mounted on the brake backing plate of both front wheels.—*General Motors Corp., Truck & Coach Div., 660 S. Boulevard East, Pontiac 11, Mich.*

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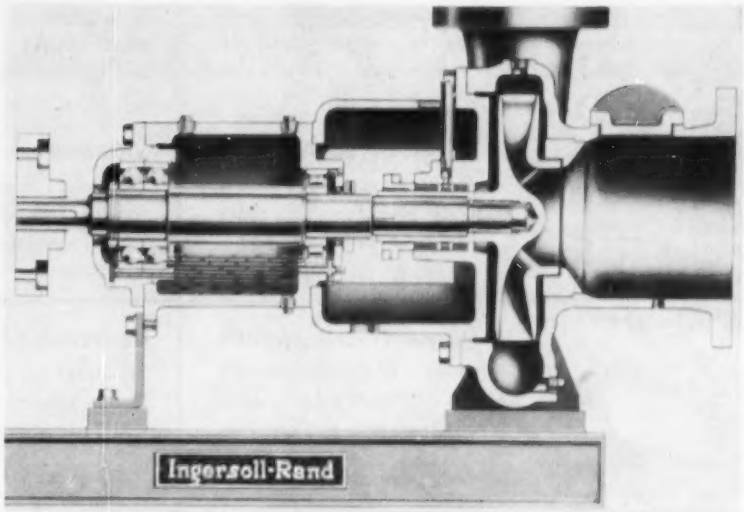

Pump's Diverging Impeller Handles Solids Gently

This new centrifugal pump employs a diverging-type impeller to handle liquids of high solids content without product damage.

Called Paper Stock and Industrial Liquid Pump, its discharge area is greater than that of its inlet—a departure from conventional design. This construction is said to prevent vapor binding, avoid clogging, and to make the pump self-venting and self-regulating. Furthermore, in processes requiring injection of large amounts of air into the pump suction, this unit may be used to replace a rotary or other positive-displacement pump.

New pumps are horizontal, single-stage units built in sizes from 4 to 12 in., capacities from 200 to 7,000 gpm., and heads from 50 to 225 ft. —*Ingersoll-Rand Co., 11 Broadway, New York 4.*

Circle 115C on Reader Service Card

New Device Detects Fire in Its Earliest Stage

Operation of a new fire-detection system, which employs radium, is independent of visible smoke, flame, or heat.

Key to the system (Pre-Detector) is a detecting head which contains a highly sensitive gas-discharge tube (cold cathode) plus two independent ionization chambers. The outer is exposed to atmosphere, while the inner is virtually closed. In each is mounted a minute foil of radium.

Sensitivity of the head is normally set so that voltage across outer chamber is less than that required to ignite the cold cathode tube. However, when combustion products (either visible smoke or invisible gases) enter outer chamber, voltage across it increases beyond tube's ignition voltage, thus making it electrically conductive. Tube in turn operates electrical relays for either visible or audible alarm signals.

A single head can protect areas up to 3,600 sq. ft. Unit attaches to a

These Flo-Sweet services cut your sugar costs

"Talk about service—we even help you plan ahead!" exclaims your Flo-Sweet Engineer. "That's why, when you use Flo-Sweet, you get greater satisfaction at every step. From the time you first consider liquid sugar, during equipment layout and installation, up through carefully timed deliveries—the Flo-Sweet technical staff is at your service. Here are six important ways they can help you save."

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Flo-Sweet specialists readily convert your present dry sugar formulas to liquid.

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Flo-Sweet's huge storage facilities free you from carrying costly sugar inventories.

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Flo-Sweet has set the pace for the industry in prompt liquid sugar deliveries.

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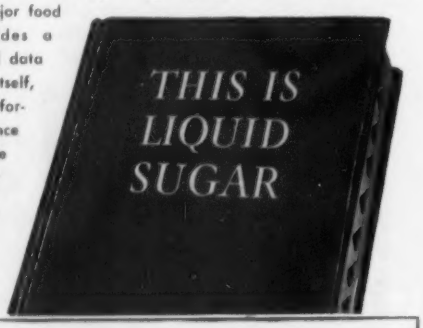
"MUST" READING FOR EVERY SUGAR USER: This authoritative new manual contains over 200 pages of detailed information on the design, installation and operation of liquid sugar systems. It covers the use of liquid sugar in major food industries, provides a wealth of technical data on liquid sugar itself, and gives specific information on performance and costs. A valuable reference work for every food technologist's library. Price $5.00.



RESEARCH

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standard 4-in.-round electrical conduit box, while multiple heads can be connected in a single two-wire circuit. Heads may be spaced up to 600 ft. apart and up to 30 ft. from side walls. Each can be adjusted to its own sensitivity without affecting the others.

For single-space protection, heads are connected directly to a fire-indicating cabinet. Relays in the cabinet may be used to close fire doors, stop ventilating equipment, activate fire-extinguishing systems, or operate central-station alarm and trouble transmitters. Only one cabinet is required for a system.

When multiple spaces are protected, heads are connected directly to the space-indicating cabinet, which is used to show exact location of fire. One cabinet guards up to 4 spaces, and as many as 16 separate spaces may be protected by a system.—*Pyrene Mfg. Co., 540 Belmont Ave., Newark 8, N. J.*

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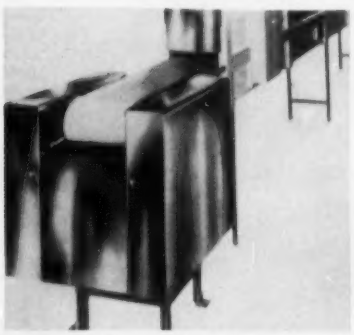

Processing Eased, Sped With New Plastic Belt

Numerous advantages are cited for a new plastic conveyor belting of polyethylene terephthalate, which may also be used as deposit sheet or table covering.

Called Permagloss, sanitary unit has a smooth surface which is easily cleaned and resistant to bacterial attack. It imparts high gloss to bottoms of coated foods, such as candy and permits rapid transfer of heat or cold to speed processing. Temperature range is —140 F. to 300 F.

Belt combines high tensile strength, dimensional stability, and resistance to moisture, oils, and chemicals. Further, special joint design makes this vulnerable part of the belt as strong as the material itself. Belting is furnished in any length, and widths to 36 in.—*Mohawk Supply Co., Market St. at 15th, Philadelphia.*

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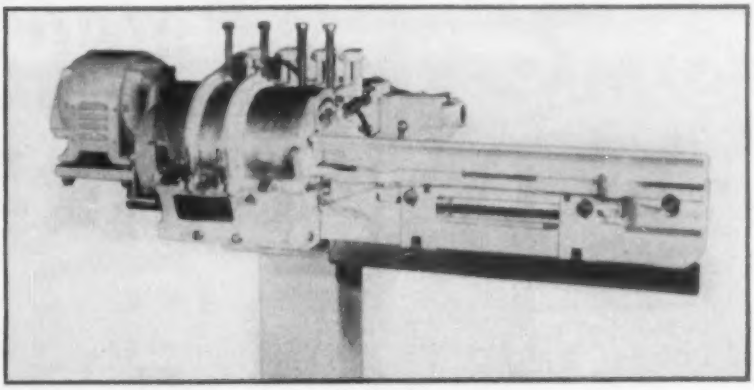

Efficient Corn Cutter Ups Quality, Reduces Costs

Increased yields, uniform cutting, and reduced operating costs are advantages cited for a new corn cutter (Model 3A Universal). Recent field tests have established low cutting costs by recovering all the corn from the cob without sacrificing quality.

Designed with new concepts of automation, unit employs an automatic size-detection system (ASD) that pre-opens the knives to size of the ears regardless of varying ear diameters. As product enters cutting head, knives instantly adjust to a deeper cut for ears of larger diameter, or a shallow cut for smaller ones.

Thus eliminated are size-grading of ears and manual adjustment of knives for maximum yields. And constant pressure of knives on product is achieved without use of springs, which results in uniform contour cutting.

Downtime is cut by an in-motion adjusting screw for manually setting the opening of the knives while machine is in operation. Costs are further reduced since the cutter head uses about 25% fewer parts. And knife redesign permits removal of all springs to eliminate manual setting of cutterhead tension.

Other improvements include an automatic lubricating system and a release arm for relieving jams caused by broken ears, or those trimmed too short.—*Food Machinery & Chemical Corp., Canning Machinery Div., 103 E. Maple St., Hoopeston, Ill. or P. O. Box 1120, San Jose 8, Calif.*

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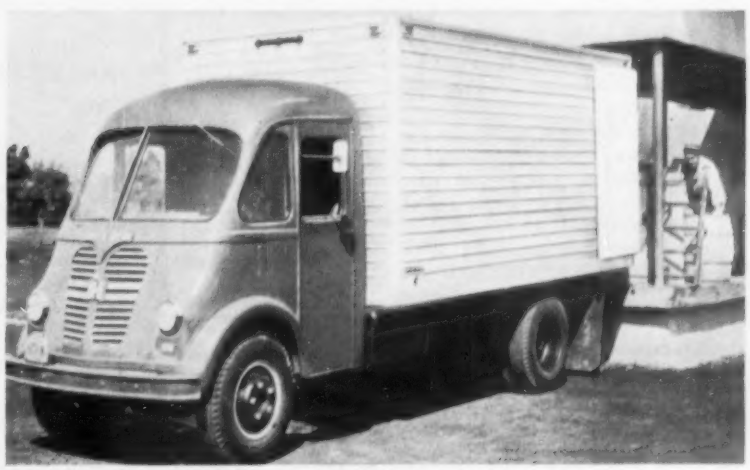

New Route Trucks Offer Performance and Styling

Specialization for retail delivery and a wide selection of two-tone color combinations are reported advantages of a new line of multi-stop trucks. Called SM-162, it offers a low-step "walk-in" cab in a variety of van and open-type bodies. Units are termed especially adaptable to local hauling and delivery of bottled goods, ice cream, and wholesale milk. With gross-vehicle-weight rating of 16,000 lb., they are available in 4 wheelbases from 137¾ to 179¾ in.—*International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.*

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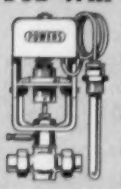

you use the right type regulator and proper size control valve. Whether a simple self-operating regulator shown at left is required or the air operated controls featured here . . . you can get both types and others from Powers. For further information call or write our nearest office.

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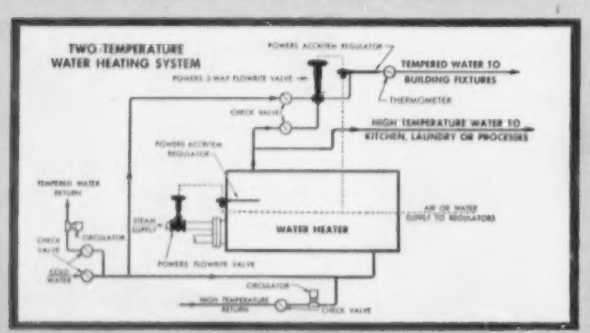

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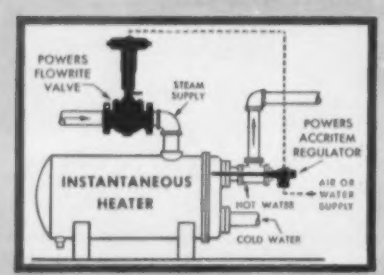

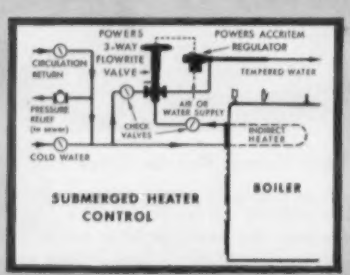

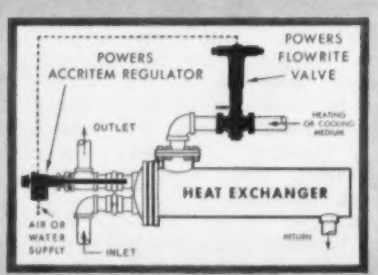

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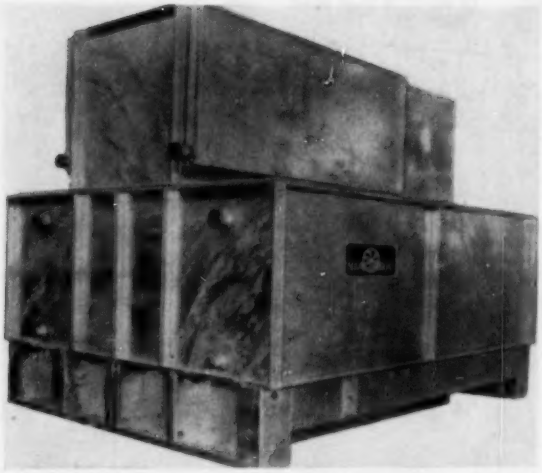

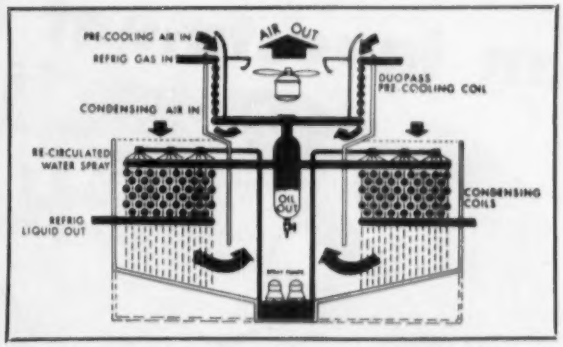

Novel Sectional Evaporating Condenser Is Easily Assembled and Serviced

Cost-cutting design of this new evaporative-type refrigerant condenser permits shipment of the casing as flat panels rather than box-like shapes. In addition, its construction is said to reduce maintenance.

Called Aeropass, all sections of the unit are encased in separately removable panels permitting access for painting or cleaning of coils from any side. Removal of a single panel exposes the central plenum and puts all interior parts within reach. Ratings for ammonia refrigeration are 90, 120, 180 and 240 ton. Equipment is also applicable to Freon. The 240-ton model is about 13 ft. long, 16 ft. wide, and approximately 10½ ft. high.

In operation, refrigerant is condensed in two parallel coils that enclose the central plenum under the fan section. Water sprays are arranged over the coils and air enters from above. It travels downward and changes direction to enter the plenum, where entrained water is eliminated. Air then moves up and out through propeller fans.

Hot gas is sub-cooled before condensation by first passing through duo-pass, pre-cooling coils mounted beside the fan section. Dry air crosses this coil to remove superheat. Any oil vapor is liquified during this process and removed by a separator in the gas line ahead of the coils. This pre-cooling also prevents high-temperature deposit of hard scale on the coils.

The only water consumed is that evaporated. Unrestricted down-draft air instantly removes excess water from the coils, thus improving heat transfer from refrigerant gas to air. Excess water is recirculated.—*Niagara Blower Co., 405 Lexington Ave., New York City 17.*

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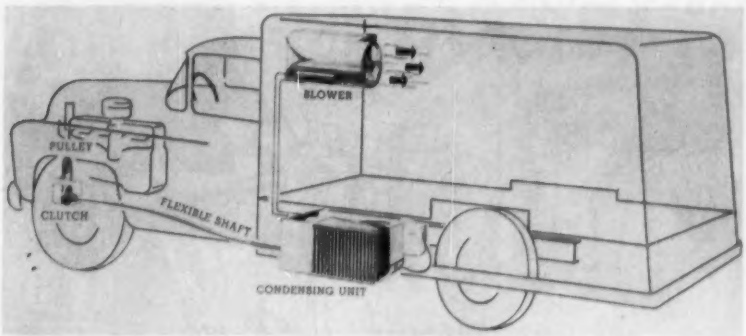

New Unit Boosts Truck-Refrigerating Efficiency

Five innovations are cited for a continuous truck-refrigeration system having simplicity of operation, fast pull down, and automatic frost prevention.

Named the Kold-Trux Mark 100B, unit weighs only 410 lb. and is complete with power source, condensing assembly, and blower evaporator. It is designed for medium- and high-temperature truck bodies.

First advantage is a simple mechanical power train that saves the weight of auxiliary equipment in driving the system. Power is taken from the engine crankshaft pulley through a simple electric clutch. It is then transferred to the condenser through a flexible shaft of a type commonly used in truck power-transmission applications. Assembly weighs 64 lb.

Stand-by power is provided by an electric motor that drives the condensing unit without operating truck's engine. Thus, a smaller motor provides greater stand-by refrigeration. Systems are available with 1, 1½, 2, and 3-hp. stand-by motors.

Next, the condenser's fan and shrouding design uses entire coil surface for dissipation of heat. Its light fan, located on the cool airside of the coil for greater efficiency, operates with minimum noise. Condensing unit includes a high-speed automotive-type compressor and 1-hp. motor. Weight: 286 lb. Skirt is mounted directly on the vehicle chassis, thus condensing unit requires no "beefing up" of body structure.

Third, system has a blower (Turbo-Jet) that recycles air in seconds. This results in greater movement of air through the coil and better circulation through the truck body. Blower weighs 60 lbs.

Also, condenser and blower fans are driven by a high-speed generator that requires no battery. Current is produced independently of the truck's electrical system.

Finally, the system is automatically balanced. Compressor operates whenever the engine runs, unless it is turned off by a switch. An anti-frost valve on the blower coil balances the system to deliver capacity needed for the load. It also prevents frost accumulation on the coil to eliminate loss of efficiency.—*Tranter Mfg. Inc., Lansing 4, Mich.*

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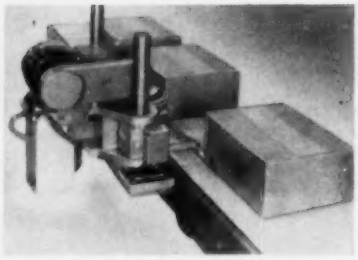

Flexible Case Imprinter Offers New Controls

Incorporating two improvements, this automatic conveyor-line attachment offers accurate, high-quality imprinting of containers.

Motor-driven unit (750 Rolaprinter) has a microswitch-activated device that controls placing of the imprint. Thus, it appears in desired location even with irregular case flow along the conveyor.

Second feature is a verticle flexographic printing system with a variable-speed mechanism. It synchronizes printing action with surface speed of containers and uses fast-drying ink of any color. Rubber type or dyes are readily changed and a large reservoir provides sufficient ink for a normal day's continuous operation.

Machine operating at speeds up to an imprint per sec. may be quickly adjusted for containers of different size, or to vary imprint location. It permits printing to a maximum height of 12 in. anywhere on the container within 1 in. of its bottom or top. Four models produce imprints up to 4 in. high and 9½ in. long.

Unit imprints copy such as contents identification, brands, varieties, or export markings on the side of containers. Wooden fruit crates can also be handled.—*Adolph Gottscho, Inc., Hillside 5, N. J.*

Circle 121A on Reader Service Card

Ease of Handling Marks New Ice-Slinging Hose

Designed to blow crushed ice into fresh-food carriers, this improved hose reportedly is less expensive, lighter, more flexible, and easier to handle than the previous model.

Called 25W336, it is a wire-inserted, hand-built unit with a smooth ¼-in. tube compounded of abrasion-resistant rubber. The cover is fluted.

Sizes range from 3 to 5 in. i.d., lengths from 3 to 50 ft.—*Goodyear Tire & Rubber Co., Akron 16, Ohio.*

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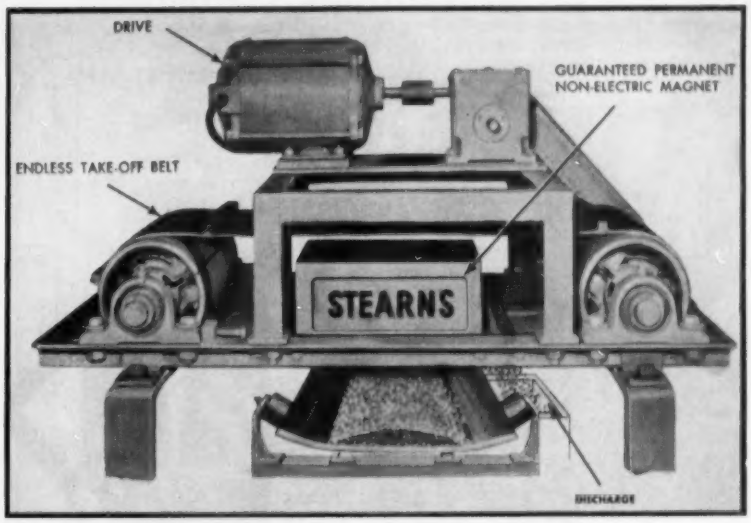


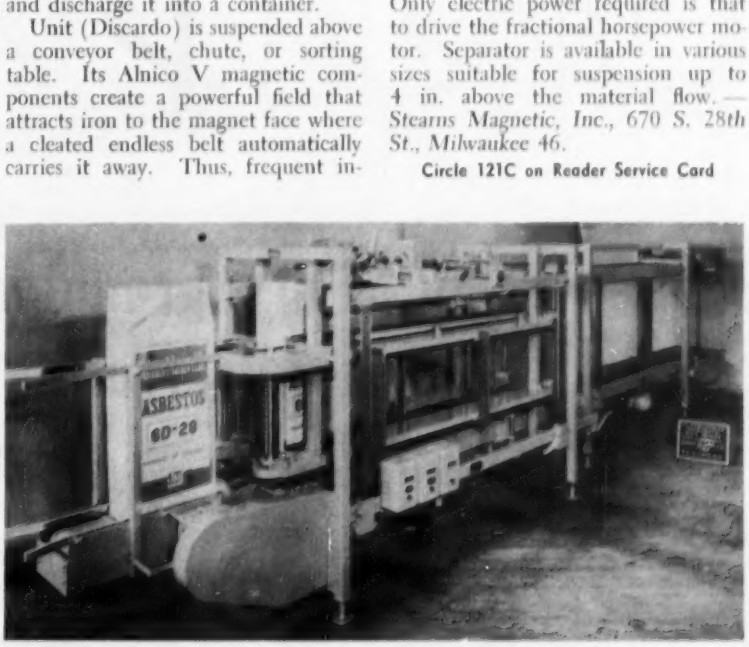
Cross-Belt Magnet Discharges Iron Continuously

This cross-belt permanent magnet is designed to continuously remove tramp iron from high-speed conveyors and discharge it into a container.

Unit (Discardo) is suspended above a conveyor belt, chute, or sorting table. Its Alnico V magnetic components create a powerful field that attracts iron to the magnet face where a cleated endless belt automatically carries it away. Thus, frequent inspection and cleaning are eliminated.

Included in the assembly is an integrally mounted motor-reducer drive. Only electric power required is that to drive the fractional horsepower motor. Separator is available in various sizes suitable for suspension up to 4 in. above the material flow.—*Stearns Magnetic, Inc., 670 S. 28th St., Milwaukee 46.*

Circle 121C on Reader Service Card



Paper Bags Automatically Glued and Sealed

A new automatic high-speed bale sealer reportedly simplifies handling, gluing, and sealing of paper bags up to 100 lb.

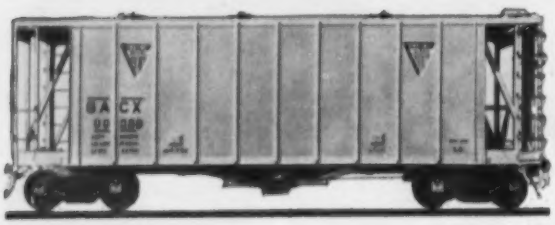
Called Packomatic, unit is a heavy-duty machine with square tubular framework offering maximum strength with minimum bulk. Further, it can be factory customized to practically any bale size and production requirement.

In operation, bales are automatically fed from a conveyor in an upright position and individually timed into the machine. Vertically traveling pushers then take it through back-tucking, gluing, and second folding and gluing operations.

On discharging, bale is fed immediately into the compression section which consists of top and bottom driven belts over 14-in.-wide rolls.

No bills for bags, drums, containers!

Bulk shipping of dry, granular and powdered products in General American Airslide® Cars is safer, easier—and costs less!



Over 1000 Airslide Cars now in service or on order. A small blower is all you need to unload cars into any conveying system. Write for bulk shipping information on your products.

AIRSLIDE GENERAL AMERICAN TRADE MARK

GENERAL AMERICAN TRANSPORTATION CORPORATION

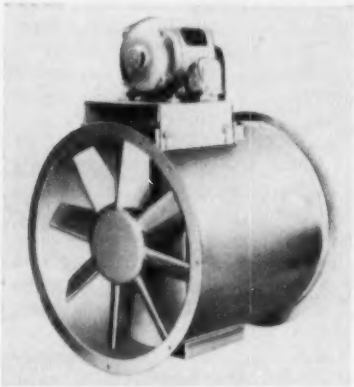
135 South La Salle Street, Chicago 90, Illinois

Airslide cars now successfully shipping flour, semolina, sugar, starch, plastics, chemicals and other products

This section is intermittently driven by a motor separate from the gluer drive.

Bale specifications: Height, 16 to 40 in. (in 6-in. increments); width, 7 to 9 in.; length, 15 to 18 in.—*J. L. Ferguson Co., Joliet, Ill.*

Circle 121D on Reader Service Card



Efficient Fan Operates At Low Noise Level

Two aerodynamic principles incorporated into design of a new line of fans offer increased efficiency and quieter operation.

Heavy-duty unit shown above (Type "L") has streamlined contours on all surfaces that contact the air stream Its enlarged hub approximates motor diameter to reduce air turbulence.

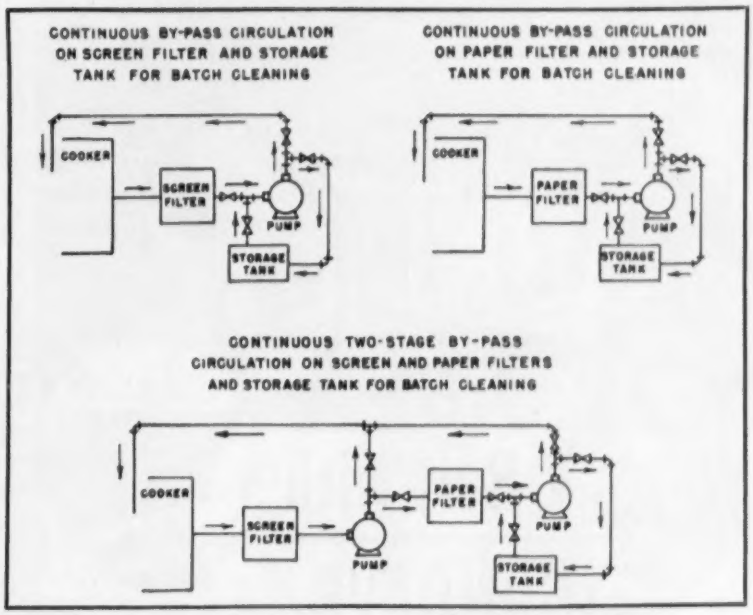
For higher efficiency, blade angles decreasing from hub to tip divide air velocity evenly. Hence there are no "dead" spots. Fans ranging in size from 12 to 72 in. with static pressures from ⅛ to 3½ in. deliver 1,240 to 102,000 cfm.

Units are compact for quick, easy installation and blade guards can be furnished for front or rear. Low maintenance enables placing of fans in hard-to-reach spots. Further, they can be supplied with acid-resistant coatings for corrosive service.

Automatic louvers are used with wall-mounted fans to protect against rain and snow. All bearings are inside the frame, thus not exposed to the weather. Steel penthouses are designed for roof-top installation and are furnished with automatic louvers.

Wheels of 2, 4, 6, and 8 blades are available for various pressures and volume requirements. Eight models offered for all types of ventilating needs include fans with direct and V-belt drives.—*Chicago Blower Corp., 9869 Pacific Ave., Franklin Park, Ill.*

Circle 123A on Reader Service Card



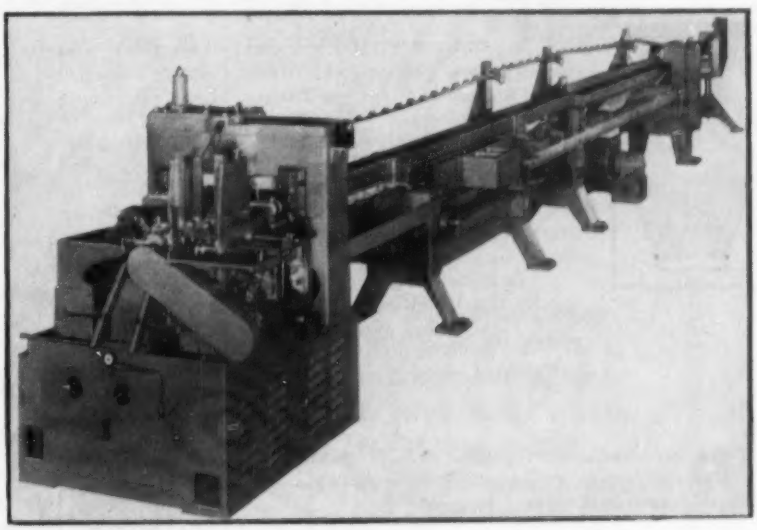
Continuous Frying-Oil Filters Cut Costs, Boost Q.C.

Time and labor consumed in batch filtration of frying oils may be eliminated, and quality control improved, by use of continuous filters. They handle high sediment loads and withstand high-operating temperatures.

Paper and/or rotary screen units make filtration fully automatic, and equipment design offers a clean surface at all times. Filters are permanently connected to the cooker, while a by-pass to storage tank provides for overnight holding, or cleaning.

Easily cleaned units are available in single or two-stage models with capacities from 8 to 200 gal. per min.—*J. W. Greer Co., Wilmington, Mass.*

Circle 123B on Reader Service Card

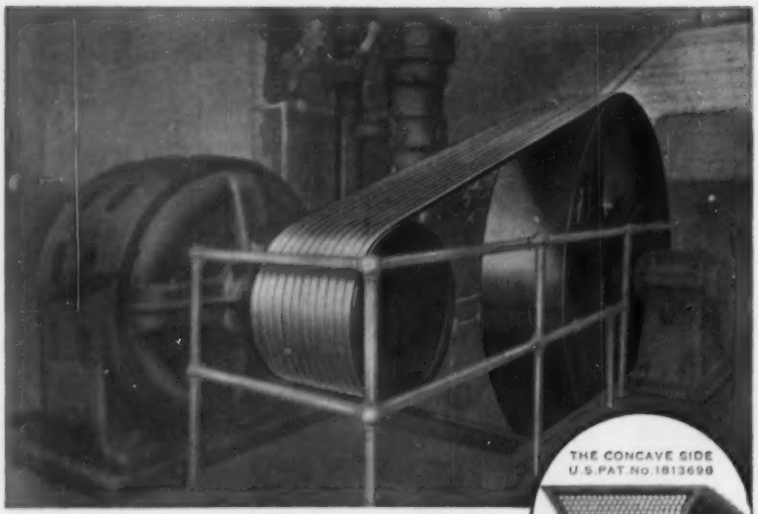


Compact Unit Produces 400-450 Cans Per Min.

This improved bodymaker offers greater compactness and a new solder attachment with overhead drive for longer wearing and easier adjustment.

Built for sustained, automatic operation at 400-450 per min., unit (No. 403) handles cans ranging from 2⅛ to 5½ in. high and 2⅛ to 4¼ in. dia. Can-size adjustments are quickly and easily made.

Work table of compact machine has knurling, notching, edging, and



Why a V-Belt with CONCAVE SIDES wears longer

It is easy to demonstrate to yourself why the concave sides (Fig. 1) of the Gates belt greatly lengthen belt life.

Simply bend a Gates belt and feel the sides. Notice how these precisely engineered concave sides *fill out* on the bend and *become straight.* Thus a Gates belt grips the sheave groove evenly (Fig. 1-A) and wear is distributed uniformly across each side of the belt. That means longer belt life; lower costs.

Make the same test with a straight-sided belt (Fig. 2) and see what happens. The sides bulge out on the bend (Fig. 2-A) concentrating the wear at points shown by arrows.

To assure longer wear and keep belt costs down, specify the V-belt with concave sides—Gates Vulco Rope . . . readily available from nearby distributor stocks. The Gates Rubber Company, Denver, Colorado —*World's Largest Maker of V-Belts.*

There are Gates Engineering Offices and Distributor Stocks in all industrial centers of the United States and Canada, and in 70 other countries throughout the world.

TPA 60

Gates VULCO ROPE Drives

Equipment & Supplies

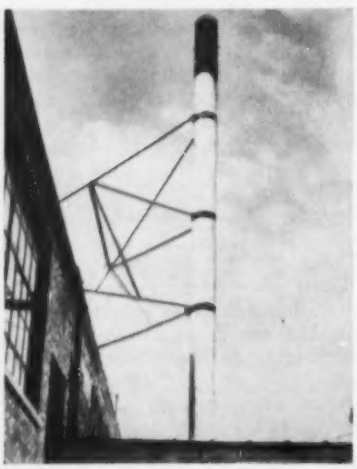
pre-fluxing attachments, but no idle station. A new single-station, double-action edger is driven by a short eccentric which contributes to speed. The forming horn is stationary for precise alignment with solder attachment.

Latter is a 3-station, water-cooled, outside-horse type. Its overhead can-carrier chain is driven by its own motor. Solder-attachment drive is by a take-off on the main motor. However, it has an emergency motor to provide power for clearing can bodies from the horse if the body maker stops.

A cam-actuated overhead blank lock prevents movement in the forming station, thus providing a well-rounded can. Notching chips are removed by compressed air to prevent their jamming of carbide dies or getting into machinery. Bodymaker is complete with automatic controls, limit switches, and control panel.

Other advantages: Use of short-stroke, short-length cranks for smooth operation at high speed; simplified design which makes essential parts likely to require adjustment readily accessible, and a rugged cast Meehanite base and frame.—*E. W. Bliss Co., 50 Church St., New York City.*

Circle 123C on Reader Service Card



Economical Stack Design Combines Steel, Brick

A pre-cast insulated masonry stack, designed to combine the low cost of a steel unit with the permanence and high draft of a brick stack, is offered in a range of six sizes from 10 to 24 in. i.d.

New unit (Van-Packer) is an all-fuel, refractory stack for use with boilers, furnaces, ovens, retorts, and

Nash Instrument Air Compressors deliver only clean air, free from oil or dust, and without filters

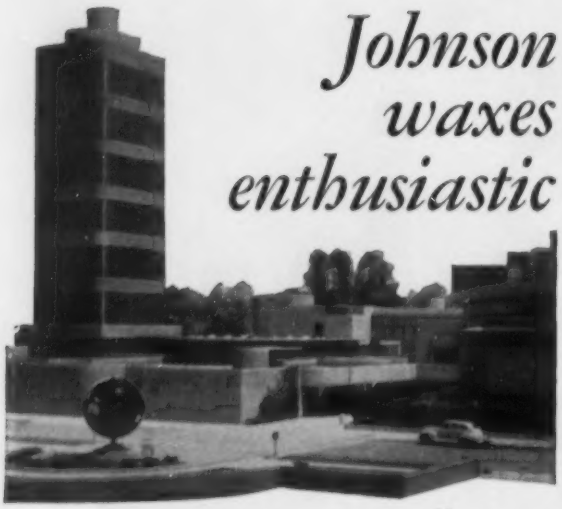
Here is Why!

You can dispense with oil filters and dust filters when you install ®Nash® Clean Air Compressors. You can save the cost of maintaining these devices. You can greatly reduce instrument maintenance costs. For the Nash employs no internal lubrication, therefore no troublesome oil is in the delivered air. Moreover, air from a Nash is thoroughly washed and cooled as it passes thru the pump. Dust in the plant atmosphere, even fly ash, is immediately removed.

®Nash® Clean Air Compressors are simple, with only one moving element. No valves, gears, pistons, sliding vanes, or other enemies of long life and constant performance complicate a Nash. No aftercoolers are needed. You will find it profitable to investigate these pumps, now.

No oil filters.
No dust filters.
No internal lubrication to contaminate air handled.
No internal wearing parts.
No valves, pistons, or vanes.
Non-pulsating pressure.
Original performance constant over a long pump life.
Low maintenance cost.

NASH ENGINEERING COMPANY
395 WILSON, SO. NORWALK, CONN.



Johnson waxes enthusiastic about GUSTIN gb BACON SNAP*ON

In the strikingly modern plant of the Johnson Wax Company in Racine, Wisconsin, molten wax flows through an extensive maze of piping. Steam tracers coil about the piping to keep these waxes fluid, and of course, insulation is a "must".

To insulate this piping, the Johnson Company selected lightweight G-B Snap*On, the one-piece molded pipe insulation of fine glass fibers. The fact that Snap*On is reusable was important to the company, since piping is frequently changed around to accommodate new processes. Johnson people were equally pleased with the ease of application and the snug fit of Snap*On over steam traced lines. And Snap*On's thermal efficiency — highest of any pipe insulation on the market — was still another deciding factor.

Because it is an all-purpose pipe insulation, Snap*On, with a vapor barrier jacket, was also selected to insulate chilled water lines in the Johnson plant. Snap*On is available in a wide range of pipe sizes up to 33", in a variety of wall thicknesses and jackets. If you, too, are looking for a new and better way to insulate cold or heated piping where temperatures do not exceed 350° F, write for the full story, on Snap*On . . . today!

GUSTIN-BACON *Manufacturing Company* GUSTIN gb BACON

Thermal and acoustical glass fiber insulations • Pipe couplings and fittings • Molded glass fiber pipe insulation

272 W. 10th St., Kansas City, Mo.

incinerators where flue-gas temperatures do not exceed 1600 F. for continuous exposure. It is made of 3-ft. sections cemented one on top of the other with acid-proof, high-temperature joint cement.

Each section consists of a vermiculite concrete insulating wall, and an aluminum outer jacket which eliminates maintenance and painting. Joints are secured by aluminum bands and stack can be used as an inside or outside chimney.—*Van-Packer Corp., Bettendorf, Iowa.*

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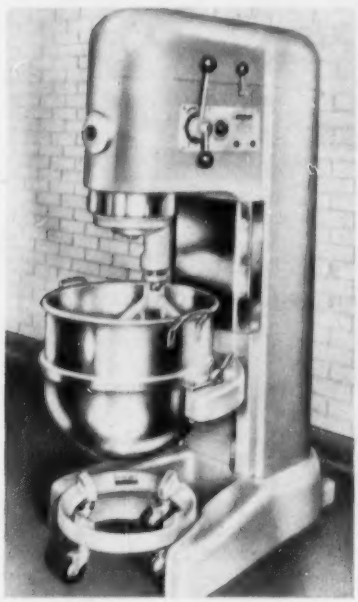


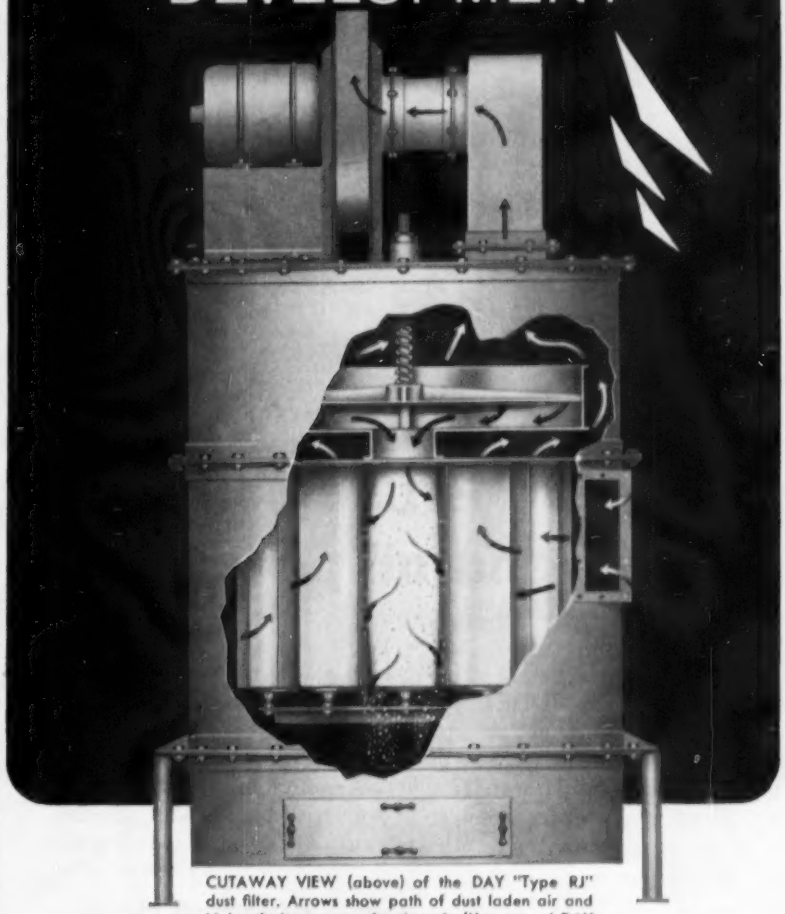
Redesigned Mixer Offers Many Improvements

Redesigned for simpler operation, this 80-qt. mixer offers improved controls for power lifting, timed mixing and 4-speed shifting. Also cited are reduced floor-space requirement (26 x 34¾ in.), and easier accessibility for cleaning and servicing.

Called Model M-800, it employs a solenoid-type pushbutton starter with thermal overload and automatic reset. Main drive gear is of nylon and steel, while constant mesh of alloy-steel helical gears provides quiet operation. A multiple disc-type clutch, comprising three rocker-arm and spring-cartridge pressure units, is operated by a steel shifting cone.

Mixer's power lift, which raises and lowers the bowl to any position, is controlled through a convenient lever. A timer automatically stops the mixing after a predetermined interval. It

NEW
DUST FILTER
DEVELOPMENT



CUTAWAY VIEW (above) of the DAY "Type RJ" dust filter. Arrows show path of dust laden air and high velocity reverse cleaning air. (Hersey and DAY patents applied for.)

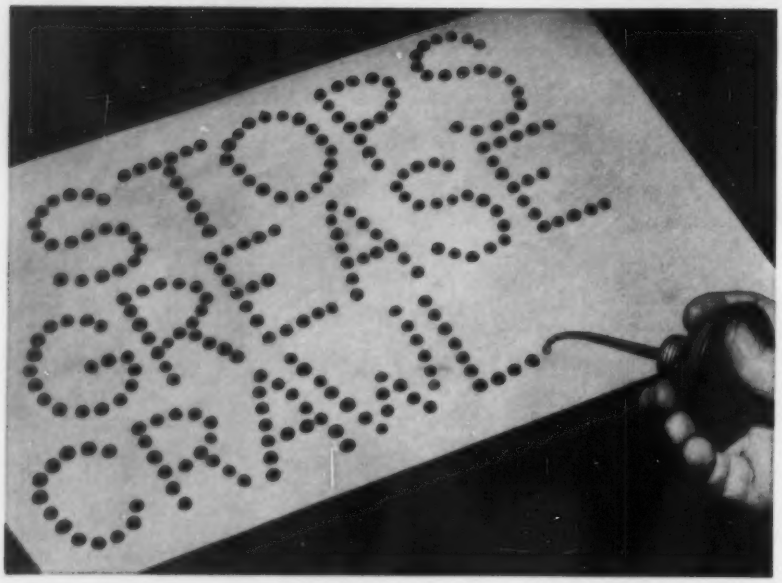
DAY "Type RJ" Dust Filter—First and Only Dust Filter to Offer All These Advantages

- An economical, high efficiency, automatic-continuous dust filter.
- Incorporates Hersey principle of high velocity reverse air for filter sleeve cleaning in a low cost unit.
- Provides efficiencies as high as 99.99+%.
- Automatic—continuous operation makes filter ideal for controlling dust created by continuous process equipment.
- Economical operation—utilizes ½ HP motor for filter sleeve cleaning.
- High air handling capacity for small space occupied by filter.
- Can be furnished for pressure or vacuum operation.
- Shipped completely assembled. Only piping and electrical connections required for operation.

The DAY "Type RJ" dust filter has many advantages to offer your plant. Get the complete facts, write toDAY for Bulletin 560.

The DAY Company
817 Third Avenue N. E., Minneapolis, Minn.
IN CANADA: P. O. Box 700, Ft. William, Ontario
Branch Plants: Buffalo, Ft. Worth, Toronto, Ontario
Representatives in principal cities

Astonishing new PATAPAR®



...gives positive control of grease and oil penetration

This unretouched photograph tells the story of the "non-penetration" qualities of new types of grease-proof Patapar Vegetable Parchment. Drops of oil placed on Patapar remain on the surface INDEFINITELY. The oil does not spread or "crawl." It does not seep through.

These special Patapars offer a revolutionary way to package products having internal or surface content of grease, fats, oils. Their effectiveness has been proven with bacon, lard, shortening, margarine, ham, oiled machine parts and many other products.

Patapar gives you WET-STRENGTH, too

The new grease-proof Patapars have the same high wet-strength that is inherent in all the many different types of Patapar Vegetable Parchment. *This wet strength is sure and permanent.*

In your business – Perhaps the unique qualities of Patapar will be an economical solution to a problem in your business. Tell us the problem. We'll send information and samples of the type of Patapar we recommend. Why not write today?

Patapar
Vegetable Parchment
HI-WET-STRENGTH · GREASE-RESISTING

HEADQUARTERS FOR VEGETABLE PARCHMENT SINCE 1885

Equipment & Supplies

is inoperative when set on "hold" position—thus permits convenience of non-timed operation.

Supplied as standard equipment is a self-centering 4-wheel bowl truck which simplifies conveying of batches. Mixer's dimensions: Height, 65¼ in.; width, 27¼ in.; depth 42⅜ in.—*Hobart Mfg. Co., Troy, Ohio.*

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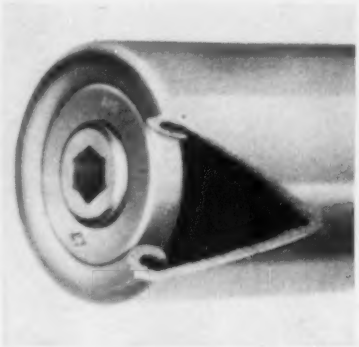

New End Roller Design Curbs Carton Damage

A new type of conveyor roller, mounted on self-contained ball bearings, reportedly eliminates roller-caused carton damage and jams on conveying lines.

Called A-F Integral End Roller, its bearings are housed in ends which are rolled inward for smoothness. This rounded lip deflects products onto and off of roller-conveyor lines without package gouging by roller ends, and promotes free travel along the line. An additional advantage cited is extra strength at roller ends with no increase in weight.

End bearings turn smoothly about a ⅞-in. hexagonal shaft. They are available in plain, dust-tight, or grease-sealed construction in two models—2¼-in. dia. 14-gage steel, and 2¼-in., 16 gage.—*Alvey-Ferguson Co., Cincinnati 9, Ohio.*

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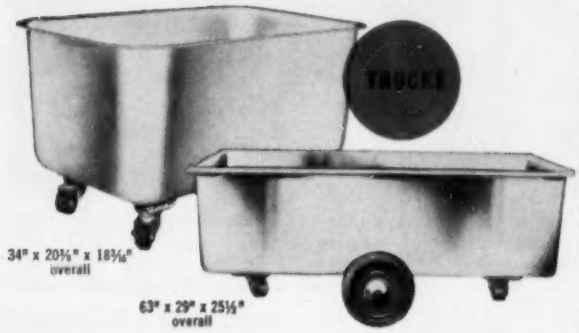
Want More Information?

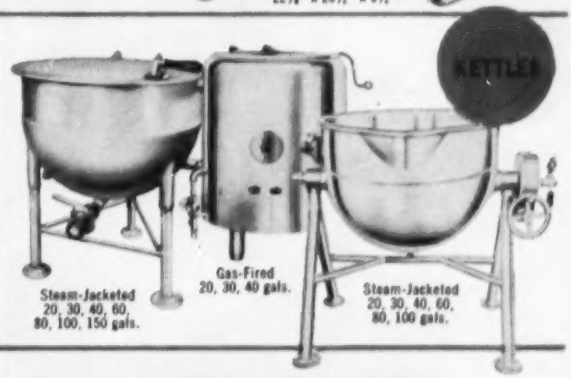
It's free—and easy to get. Simply note here the items on which you want more details, then circle each key number (there's one given at the bottom of each item) on the handy Reader Service Postcard—back of book. Then sign at the bottom and mail.

For your convenience, too, items in this department are listed and keyed in the Reader Service Section.

Leaders in Aluminum... for the *FOOD* Industry

WEAR·EVER ALUMINUM





Want to speed production? Simplify your handling or storage problems? Standard, readily available items like these may be your answer.

All Wear-Ever plant service items are made from a specially developed, tough, hard-wrought aluminum alloy to assure long service life.

Send for your copy of our catalog showing the full Wear-Ever line.

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New Catalog Ready! *SEND TODAY!*

The Aluminum Cooking Utensil Company, Inc.
302 Wear-Ever Building, New Kensington, Pa.

GENTLEMEN: *I'd like to learn more about ways in which Wear-Ever's line can help me.*

☐ Send me your catalog ☐ Have your representative see me

NAME_____

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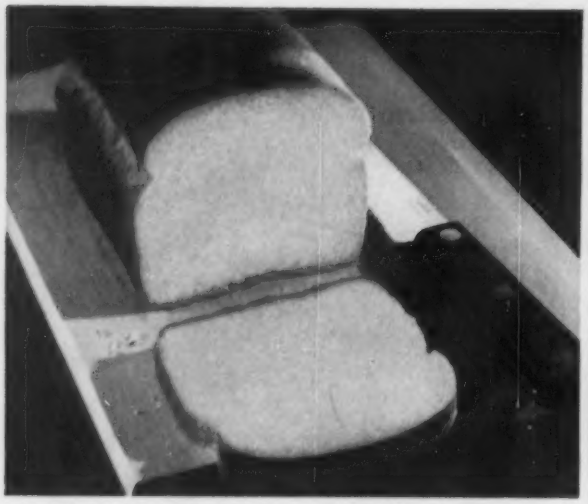
COMPANY_____

STREET_____

CITY_____ ZONE____ STATE_____

THE ALUMINUM COOKING UTENSIL CO., INC., NEW KENSINGTON, PA.



Sugar is the key to wheat flavor in bread. And of the basic sugars that nature provides, many bakers have discovered that Cerelose brand dextrose—the sugar made from corn—produces more of the finer flavor overtones in baked bread than any other sugar.

Preserving the piquant flavor of tomato products, Cerelose brand dextrose is a reducing sugar that will not mask delicate spice flavors with sweetness. Also, by retarding oxidation, Cerelose increases the shelf life of the natural red tomato color.

To boost flavor...without over-sweetness... more and more food processors are using

CERELOSE®
BRAND DEXTROSE

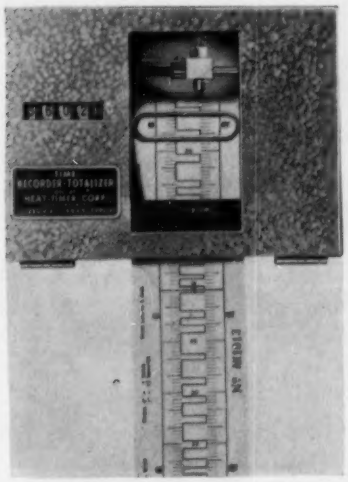
THE SPECIAL SUGAR THAT DOES SPECIAL THINGS FOR FLAVOR IN FOODS

All too frequently, true fruit flavor is masked by the sweeteners in the preserving syrup. When syrup concentrations must be increased to prevent bacterial spoilage and retain the fruit's fine texture, Cerelose brand dextrose sugar is used to protect the flavor . . . without over-sweetness.

Cerelose brand dextrose sugar is more than just a sweetener here. It accentuates the presence of butterfat to produce the kind of richness Americans like in ice cream. Also, in sherbets and ices, Cerelose allows the manufacturer to increase body without increasing sweetness.

Our technical staff welcomes the opportunity to show you why you should use Cerelose brand dextrose sugar in your formula. Call us today.

CORN PRODUCTS REFINING COMPANY
17 Battery Place, New York 4, N. Y.



New Instrument Records Process 'On-Off' Time

Providing a continuous-operating record of any electrically operated machine or process, this unit is said to improve production control and minimize down time.

Marked tape, passing through the unit (Time Recorder + Totalizer) records the time and duration of every "on" and "off" period of the equipment. In addition, the totalizer gives a record of total "on" time for determining servicing schedules.

Instrument can be installed either as an integral part of the equipment, remote, or as a portable tool. It operates on 115/220v. a.c. Standard tape speeds are 1 in. per 5 min., 1 in. per 15 min., and 1 in. per 60 min.—*Heat Timer Corp., 657 Broadway, New York City 12.*

Circle 131A on Reader Service Card

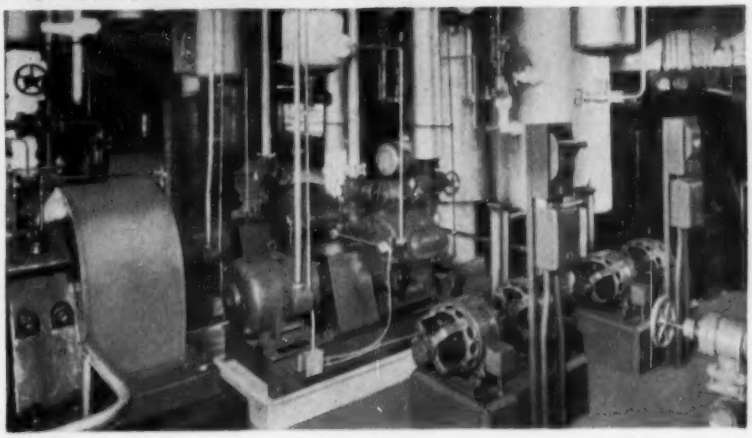
Variegates Ice Cream At 1,000 Gal./Hr.

Higher capacity, ease of operation, and precise design control are advantages reported for a new ice cream variegator for injecting syrups (fruit and chocolate) into rainbow ice cream and sherbets.

New model (V-56) has a larger mixing chamber and inlet, which permits feeding from two lines or two freezers at 1,000 gal. per hr. Syrup

Merchants Ice and Cold Storage Company, relies on performance-proven Vilter equipment.

The two Vilter ammonia booster compressors which were placed in operation recently.



Q- Why was Vilter Refrigeration Equipment again selected by a large Louisville Cold Storage Plant?

A. because Vilter REFRIGERATION

costs less to own*

Performance is its own best recommendation. For twenty-four years two Vilter horizontal, triple suction, multiple effect ammonia compressors performed efficiently and dependably with a minimum of maintenance for the Merchants Ice and Cold Storage Company, Louisville, Kentucky.

This accomplishment was all the proof needed for this storage company to install recently two new Vilter VMC Booster Compressors. Additional refrigeration capacity was demanded to meet the increasing needs for freezing and storing frozen foods.

Other Vilter equipment installed here includes: a gas and liquid cooler, a suction accumulator and vaporizer, a rotary liquid pump, fin coils, and eight air units.

All this equipment has performed to the highest expectation of the customer.

It will pay you, too, to standardize on Vilter refrigeration and air conditioning equipment for your operation.

* Savings in low first cost are not the complete answer when considering the installation of refrigeration equipment. But savings in terms of years of extra service, reliable performance and minimum maintenance—that's where Vilter excels in low-cost ownership.

Vilter®

QUALITY CRAFTSMANSHIP that lasts . . .

ENGINEERING DESIGN that guarantees performance

REFRIGERATION and AIR CONDITIONING

THE VILTER MANUFACTURING COMPANY, Milwaukee 7, Wisconsin

Air Units • Ammonia & Freon Compressors • Booster Compressors • Baudelot Coolers • Water & Brine Coolers • Blast Freezers • Evaporative & Shell & Tube Condensers • Pipe Coils • Valves & Fittings • Pakice & Polarflake Ice Machines

"It's far simpler to use one cleaner for all surfaces."

WHY confuse your maintenance men with a closet-full of special cleaners — when you can use WEST's *All-Purpose Cleaner*.

It simplifies:
— cleaning routines
— reordering
— inventory records
— storage space.

LOW cost and quantity prices save you money. Too, a little WEST *All-Purpose Cleaner* goes a long way. You use only three ounces in a gallon of water. You get exceptional detergency — even in hard water — without high alkalinity. It cleans just about anything:
— floors of all types
— painted or unpainted surfaces
— tile
— leather
— plastics
— glass
— many other materials.

LET a WEST Sanitation Specialist demonstrate the advantages of *All-Purpose Cleaner*. Just write. Or call your local WEST office.

OLDEST AND LARGEST COMPANY OF ITS KIND IN THE WORLD

75th ANNIVERSARY
WEST DISINFECTING Company

FREE FOLDER
Use your business letterhead to request our folder on the economies of ALL-PURPOSE CLEANER.

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Dept. 8, 42-16 West St.
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Branches in Principal Cities • In Canada: 5621-23 Casgrain Avenue, Montreal

Equipment & Supplies

is completely enrobed by the ice cream to prevent smudging on the outside of the carton and locked-in baskets curb off-center patterns. Interchangeable baskets can be used either in an 8-line or 6-line pattern.

Machine's tapered end controls even flow of the design, while fruits or sauce are distributed automatically. Product flows directly into containers which include bulk cans, half gallons, Philadelphia pints (through Anderson or Excello units), and round and half pints.—*American Food Laboratories, Inc., 860 Atlantic Ave., Brooklyn, N. Y.*

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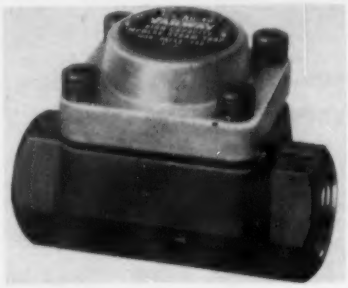

For Severe Service: New Impulse Trap

Designed to handle heavy condensate loads, especially where dirt and scale are a problem, this stainless-steel impluse steam trap has about three times the capacity of maker's former model of the same size.

Typical applications for the unit (Series 40) include heating coils, kettles, dryers, evaporators, autoclaves, and heat exchangers. Providing high capacity at all pressures to 600 psi., it also offers freeze-proof operation against back pressures up to 50%.

Traps are now available in ½ and ¾ in. models, with larger sizes soon to be offered.—*Yarnall-Waring Co., Philadelphia 18.*

Circle 132A on Reader Service Card

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An Amazing New Money-Maker for Any Plant Packaging 3000 or More Bags Per Day!

THE TRIANGLE AUTOMATIC
BAG MAKER and FILLER

First and only machine of its type practical and profitable for small plants as well as large ones

MAKES THE BAG! FILLS THE BAG! SEALS THE BAG!

Amazingly Low Priced!—Priced at about one-half that of any machine for the same purpose . . . an investment so attractive that if you are packaging *as few as 3000 bags per day,* it will pay for itself in *less than one year!*

Fast!—*output is determined by number and speed of the weighing scales — not by the number of bag making tubes* . . . fills and seals 30 to 50 perfect bags per minute—every minute.

Fantastically Simple!—Never before was there a bag making, filling and sealing machine so utterly simple . . . with so few parts . . . without difficult adjustments . . . without complicated mechanisms. Any of your operators can run it.

Flexible, Versatile! — Handles diverse range of products in all size bags up to 6″ face by 12″ long. Quick, easy changeover.

A Tremendous Money-Maker! — Get full facts and figures today. Return the coupon for new literature. There is no obligation.

TRIANGLE *Since 1923:*
Weighers, Fillers, Powder Packers, Carton Sealers, Wrapping Machines, Bag Makers

TRIANGLE PACKAGE MACHINERY COMPANY
6637 West Diversey Avenue, Chicago 35, Illinois

Triangle Package Machinery Company
6637 W. Diversey Ave.
Chicago 35, Illinois

Please send bulletin on the new bag maker-filler:

Company _____

Street _____

City _____ Zone ____ State ____

Your name and position _____

Standard Oil's Stan Nelson (left), with Federal Bakery men (l. to r.); E. L. Hostettler, general sales manager, C. F. Baumann, garage superintendent and Wendel Fish, general manager, inspects one of bakery's trucks that has 100,000 miles of service and yet has required no major maintenance.

It takes a lot of work to deliver a loaf of bread

Federal Bakery Co., Winona, Minn., makes it as easy as possible — uses only **STANOLUBE HD-M** *Motor Oil*

Federal Bakery Co., Winona, Minn., keeps close watch on maintenance costs, has one of industry's lowest cost-per-mile records. S. E. Nelson (left), Standard Oil automotive lubrication specialist, Arne Steivang (center) and Charles Baumann, Federal Bakery garage superintendent, confer about truck maintenance records. Helping customers with lubrication problems is something Stan Nelson is well qualified for. An engineer with a degree from the University of Minnesota and a graduate of Standard Oil Sales Engineering School, Stan has 8 years' experience. Customers find help from Stan Nelson pays off—*for them.*

Everyone expects bread to be delivered fresh and on time. The housewife makes no allowances for rugged delivery schedules, bad weather, tough roads. Federal Bakery Company makes fine bread and delivers it to Southeastern Minnesota and Western Wisconsin *on schedule* no matter what the weather. A good PM system and the use of STANOLUBE HD-M Motor Oil in all of the company's trucks are two of the big reasons why Federal gets the job done.

And getting the job done is not just good enough for Federal. The Federal fleet of 40 Ford units —F-1's to F-600's—has one of the lowest cost-per-mile records in the Quality Bakers of America membership. Federal Bakery trucks have as much as 100,000 miles without even the pan removed. Other units have 250,000 miles on the chassis with many, many more miles still to go.

This kind of performance from equipment is routine for Federal Bakery. Helping trucks deliver low cost-per-mile service is routine for STANOLUBE HD-M Motor Oil.

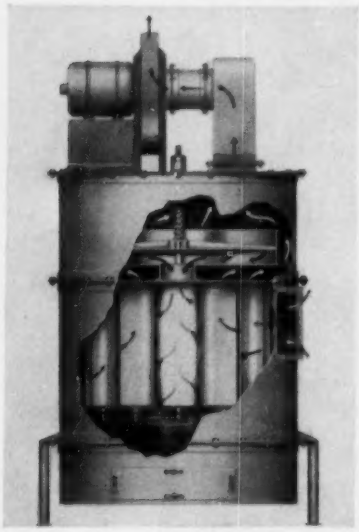
The hot engine, long haul of Federal's over-the-road units, or the short trip, low temperature, frequent idling service of street delivery units—it is all the same to STANOLUBE HD-M.

Handling extremes of service, no matter what it is—in diesel or gasoline equipment—is built into STANOLUBE HD-M. Its highest quality base stock and additive formula mean clean engine performance, no varnish, no sludge, no carbon-like deposits.

Find out more about STANOLUBE HD-M Motor Oil. Call your Standard Oil automotive lubrication specialist. There is one near you in any of the 15 Midwest and Rocky Mountain states. Or write Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD

STANDARD OIL COMPANY
(Indiana)



Reverse Air Jet Cleans Automatic Dust Filter

High efficiency of this automatic continuous dust filter is attributed to high-velocity reverse air cleaning.

Handling up to 1,200 cfm., unit (Type RJ) is termed well suited to continuous process equipment since no shut down is needed for rapping or cleaning. Material discharge is automatic and continuous.

In operation, dust laden air enters inlet (right) and travels through felted filter, while dust is deposited on the outside of 12 filter sleeves. A surge of air from indexing collar and drum forces dust from sleeves (center), and clean air is carried to atmosphere (or returned to plant) through exhaust fan at top.

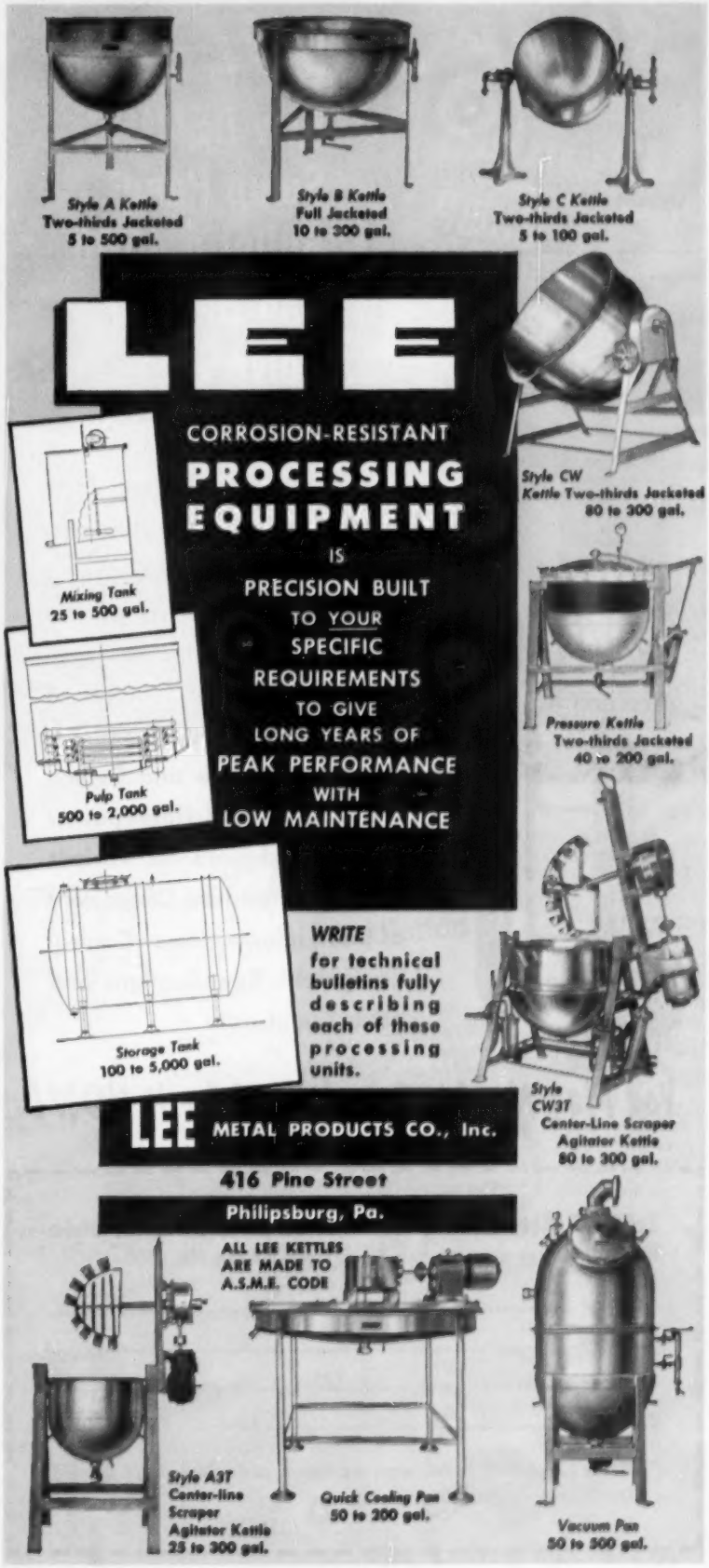
To minimize maintenance, all moving parts of the filter are located on the clean-air side of filter media. Entire unit is shipped assembled and installation requires only piping and electrical connections.

Filter is made portable by mounting on casters. It may be furnished for pressure or vacuum operation, with or without a dust stand or caster. Optional equipment includes a dust drawer or hopper for intermittent operation, or a hopper and rotary valve for continuous discharge.—*The Day Co., 810 Third Ave., Minneapolis.*

Circle 135A on Reader Service Card

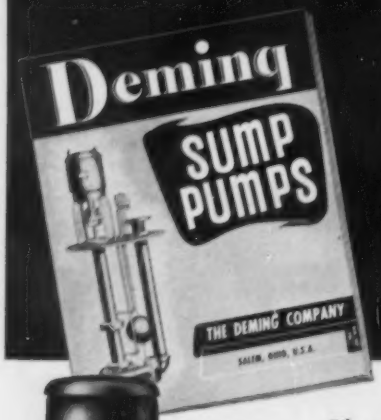
Dial Thermometers Offer Accurate, Easy Reading

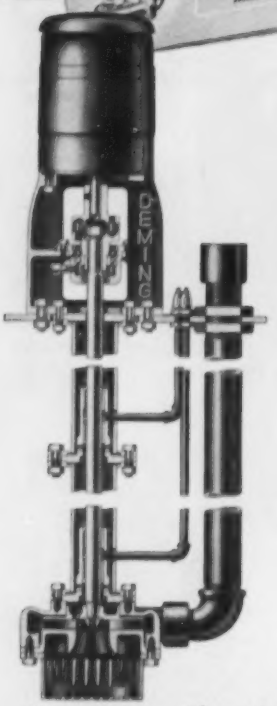
A new bimetallic dial thermometer, termed easily read and accurate within ±1% of it range, is offered for



SUMP PROBLEM?

New DEMING Sump Pump Bulletin 4500 Can Help to Solve it!





The New Deming Bulletin 4500 can help you to select the most efficient unit for a specific sump pump job. Contents of the 8-page bulletin include illustrated construction features of Deming Sump Pumps, information on Single and Duplex types, Size and Horsepower Recommendations for Various Ratings, Standard Dimensions of Units, information on Control Equipment, Specifications and other useful data.

You May Need it Soon! Send for it NOW!

(PLEASE PRINT)

THE DEMING CO., 556 Broadway, Salem, Ohio

Please send free copy of your Sump Pump Bulletin No. 4500.

My name _____

Company _____

Street _____

City _____ *Zone* ____ *State* _____

☐ Please check here if you want the names and addresses of Deming Distributors in your area.

Equipment & Supplies

a variety of services—pipe lines, tanks, ovens, washers, and cookers.

Called Bi-Therm, it is available with 3 or 5-in. dials and stem lengths of 4, 6, 9 and 12 in. Separable wells are of brass, steel, 304 stainless, or Monel. Ranges extend from −40 to +750 F., and all exposed metal parts are of arc-welded stainless steel.

Instruments are waterproof and unaffected by ambient temperature. Overrange protection is 50% to 500 F., and 10% above 500 F. Except for the 200-750 F. unit, all thermometers are silicone-damped to increase speed of response, prevent zero shift, and eliminate pointer chatter.—*Taylor Instrument Cos., Rochester 1, N. Y.*

Circle 135B on Reader Service Card

New Chemicals

Triple-Action Compound Cuts Sanitation Costs

Seen reducing labor and material costs in sanitizing operations is a new triple-action liquid that incorporates a deodorizer, detergent, and sanitizer.

Called Airkem A-3, it contains a quaternary ammonium compound offering phenol coefficients of 7.5 (S. typhosa), 9.2 (M. aureus). Material can be used on practically any surface, is non-toxic and non-flammable. It is equally effective in hot or cold, hard or soft water, and requires no rinsing.

Product is available in 1, 5, 15, 30 and 55-gal. containers.—*Airkem, Inc., 241 E. 44th St., New York City 17.*

Circle 136A on Reader Service Card

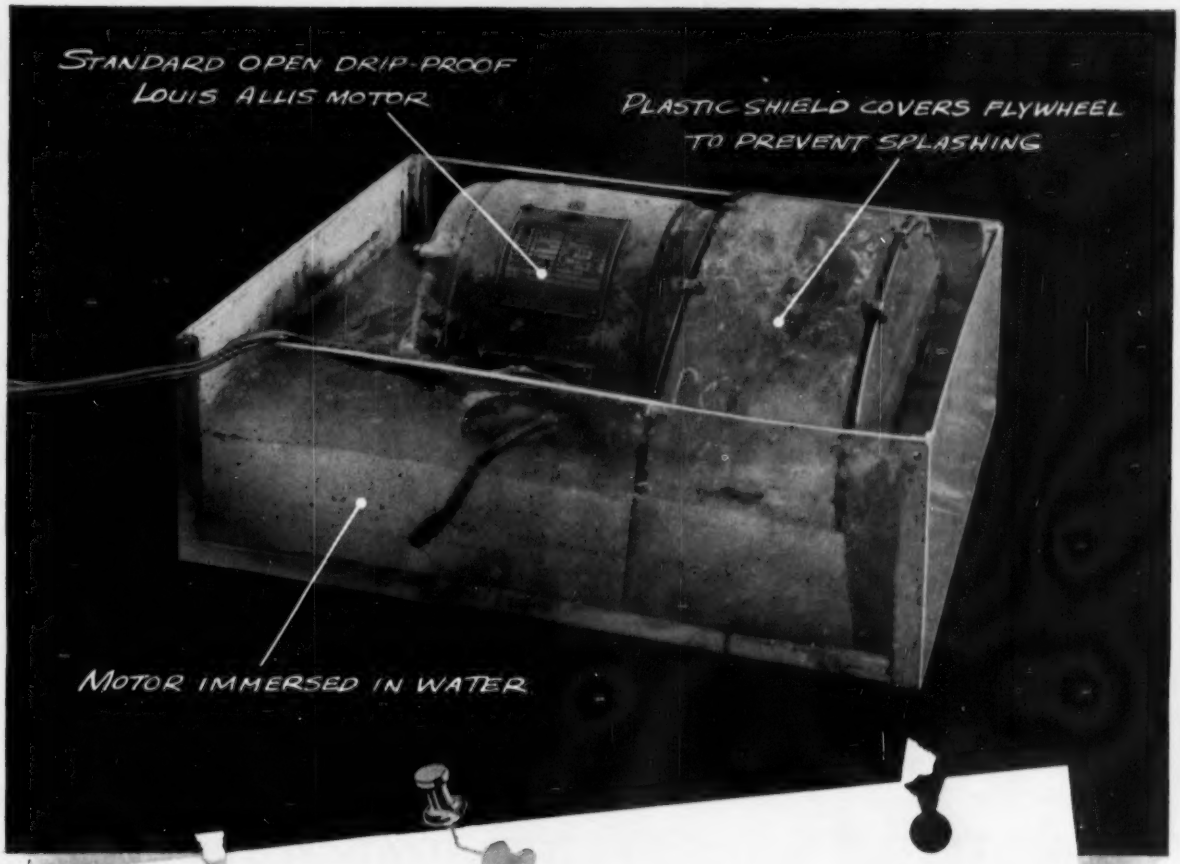
Resin Coating Upgrades Worn Plant Surfaces

Excellent adhesion to wood, metal, and concrete, plus resistance to chemicals are properties cited for a labor-saving resin coating called Glid-Iron.

As a floor coating it may be applied by spray, brush, roller, or squeegee in any thickness up to ¼ in. Application time with an undercoating gun is 20 to 30 min. for a 10x40-ft. area, and 2 to 4 man-hours by other methods.

Coating smooths out and bridges small cracks as it sets to a hard, impact-resistant finish after curing overnight at normal room temperatures. Material withstands temperatures from −20 to 212 F.—*The Glidden Co., 11101 Glidden Ave., Cleveland.*

Circle 136B on Reader Service Card



In water 1½ years...still running

Dramatic proof that Louis Allis motor insulation provides unusual moisture resistance

We wouldn't do this to a motor. But somebody did, to check our new insulation. They took a standard open drip-proof motor, placed it in water up to the shaft, and ran it a year and a half.

The motor will still run, too, which proves that our insulating materials are of top quality. One of our exclusive features is the new phenolic impregnating varnish we use. As you can see, this varnish resists moisture, but it also has excellent thermal and chemical resistance and is not susceptible to embrittlement.

Insulation usually determines the life of a motor. That's why the insulating materials used in the new L. A. line are the product of years of continuous research and development. That's why Louis Allis motors run longer . . . give less trouble.

Find out the many other advantages available to you in the new L. A. line of motors. Write for our new bulletin No. 1700.

A complete line of standard rerated motors in frames 182 through 326U now in stock. Special rerated motors are available on short delivery.

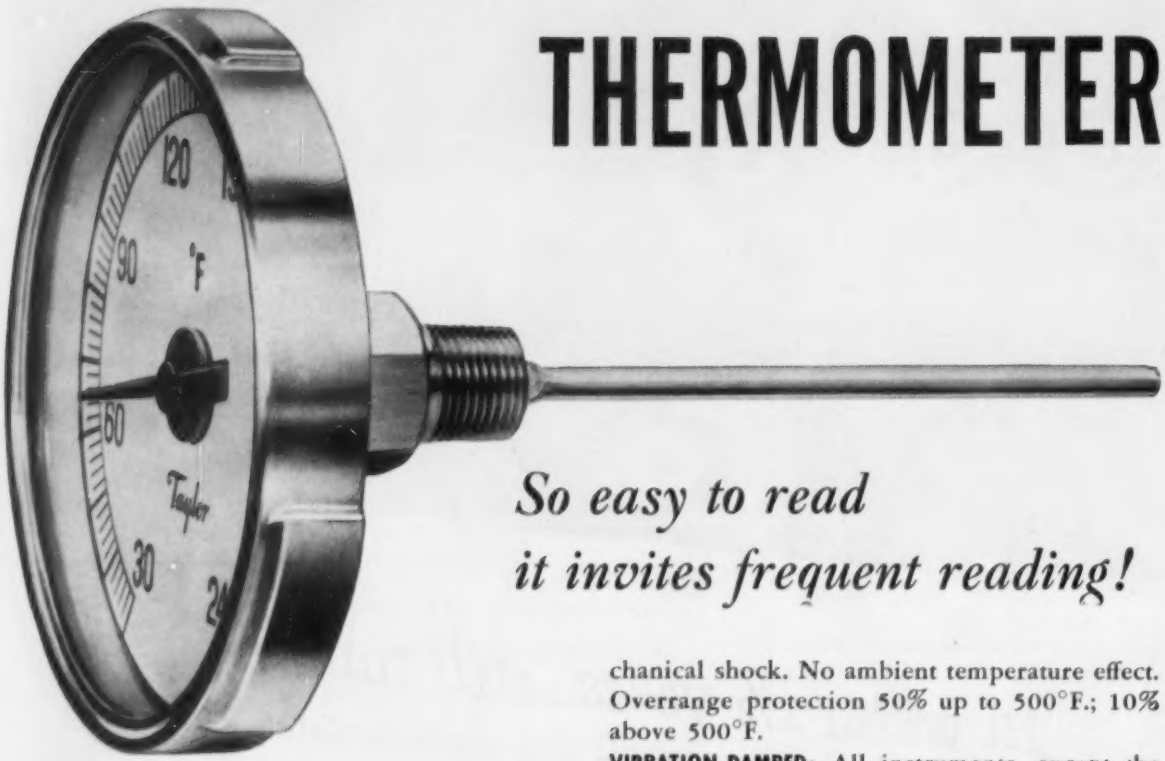
LA-307

THE LOUIS ALLIS CO.
MILWAUKEE 7, WISCONSIN

For more data, circle this page number on card at back →

Traditional Taylor accuracy in a low cost instrument

THE NEW BI-THERM* 5" DIAL THERMOMETER



So easy to read
it invites frequent reading!

A SIMPLE, dependable and economical thermometer with many applications throughout the canning industry, such as Sterilizers, Hot Water Storage Tanks, Open Tanks, Blanchers, Open Cookers, Exhausters. Wide variety of ranges from minus 40° to +750°F. Also available with three inch dial; stem lengths of 4, 6, 9, and 12 inches; separable wells of brass, steel, type 304 stainless steel or monel.

EASY TO READ: The large dials are highly readable because of black figures and graduations on an aluminum background.

RUGGED: All exposed metal parts are of arc welded, corrosion-resistant stainless steel. All instruments are waterproof. All mechanical connections are welded for greater reliability.

ACCURATE: These instruments are accurate within ±1% of range, over the entire range. Simple zero-setting features correct minor errors in readings which might result from severe mechanical shock. No ambient temperature effect. Overrange protection 50% up to 500°F.; 10% above 500°F.

VIBRATION DAMPED: All instruments, except the 200° to 750°F. range, are silicone damped against vibrations. Result is increased speed of response, minimum pointer vibration, and elimination of pointer chatter when the thermometer is handled.

ECONOMICAL: Costs only **$16** to **$26,** depending on dial size and length of stem. Ask your Taylor Field Engineer, or write for **Bulletin 98267.** Taylor Instrument Companies, Rochester, N. Y., or Toronto, Canada.

*Trade Mark

Taylor Instruments
MEAN
ACCURACY FIRST
IN HOME AND INDUSTRY

Equipment Applications

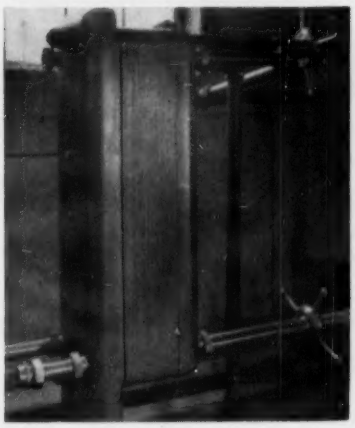


Plate-Type Exchanger Ups Product Stability

Shelf life of mayonnaise has been increased by controlled cooling of vegetable oil before it is mixed with other ingredients at the Greenville, S. C. plant of C. F. Sauer Co. This cooling thickens the oil to improve product stability.

For day-to-day uniformity, oil is pumped through a plate-type heat exchanger (Super Plate, Cherry-Burrell Corp., 427 W. Randolph St., Chicago). Using 34-F. sweet water, unit cools 1,300 gal. per hr. of 95-F. oil to 48-52 F. Control is to within two degrees of optimum temperature.

Circle 139A on Reader Service Card

Level Controls Automate Flow of Bakery Raws

One-tube electronic controls will regulate National Biscuit's materials flow in its new Philadelphia plant. Used for 2 yr. at the company's Chicago bakery, they automatically control flow of flour, cracker meal, sugar, shortening, and oil.

Operating on an electrical capacitance principle, units (Tektor, Robertshaw-Fulton Controls Co., Fulton Sylphon Div., Knoxville 1, Tenn.) sense minute changes in electrical currents. As material level changes, surrounding electrical impulses also change and are recorded by the device.

A problem at the Chicago plant was controlling level of cracker meal in filler bins, which are fed by conveyor from grinders. In case of overflow, meal backed up into the grinder where it created a fire hazard and caused downtime. Overflow is prevented by a 6-in. probe (plastic covered) installed from top of bin.

Now, meal fills the bin to within 3 in. of the top as stream is stopped.

Ice Cream Hardening

NIAGARA "NO FROST"

25 Years' Successful Experience

Fresh Meat Chilling

Get faster temperature "pull-down"

Always clean freezing or storage rooms

Protect frozen food quality

Save Power...Reduce Costs

Citrus Concentrate Freezing and Storage

Write for Niagara Bulletin 105

NIAGARA BLOWER COMPANY

Dept. F. I., 405 Lexington Ave. **New York 17, N. Y.**

District Engineers in Principal Cities of U. S. and Canada

HOW DO YOU TREAT YOUR PRODUCT?

Here's a FREE catalog to help you solve your conveying problems

• If your product requires an acid bath, a brine dip, a water shower, is cooled, dried or baked, there is very likely a Cyclone Processing Belt for you. This catalog is packed with information and illustrations to help you solve your production line problems. It covers use of conveyor belts in many fields of product processing. It's designed to help you save money and increase production with up-to-date use of Cyclone Processing Belts. Our belts are available in carbon, alloy and Stainless Steels . . . in various sizes, strengths and coatings. Cyclone can also furnish all necessary accessories. Take advantage of this valuable offer. Clip and mail the handy coupon . . . TODAY! There's no obligation.

CYCLONE FENCE DEPARTMENT
AMERICAN STEEL & WIRE DIVISION
UNITED STATES STEEL CORPORATION
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UNITED STATES STEEL EXPORT CO., NEW YORK

USS CYCLONE METAL CONVEYOR BELTS
SPIRAL WOVEN
FLAT WIRE · FLEX-GRID

USS

Mail this coupon

Cyclone Fence, Dept. H-26, Waukegan, Illinois

Please send me, without obligation, a copy of your catalog #5 on Cyclone processing belts.

Name.....

Company.....

Address.....

City.....State.....

UNITED STATES STEEL

Equipment Applications

Once the volume drops to a safe level, the conveyor automatically starts to refill the bins.

Another application, requiring an armored unit, solved a flour-storage problem. Flour, received in rail cars, is unloaded into 60-ft.-high bins pneumatically. To regulate the flow, controllers were connected to a 50-in. probe extending down into each bin. Flow stops when level rises to within 50 in. of the top. The remaining 50 in. handles flour held in the conveyor tubes.

Circle 1398 on Reader Service Card

Briefs . . .

Pilot-Plant Freeze Dryer provides data on new materials from which optimum drying cycles may be determined. Automatic system has 6-liter capacity. — *Naresco Equipment Corp.*, 160 *Charlemont St., Newton Highlands* 61, *Mass.* (140A)

Packing-House Cooler, redesigned for narrow brine-spray decks of chill room, employs hot-galvanized casing, heavy-plate construction.—*Niagara Blower Co., 405 Lexington Ave., New York City* 17. (140B)

Low-Cost Analyzer, used with narrow-band ultra-violet, visible, and infra-red filters, simplifies process and quality control.—*Axler Associates, Inc.*, 102-42 43*rd Ave., Long Island* 68, *N. Y.* (140C)

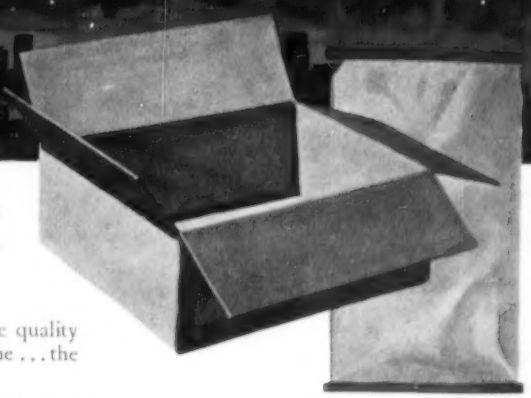
Freezer-Room Clothing, made with water-repellent, cotton-duck outer covering and Dacron insulation, protects workers at below zero temperatures.—*Refrigiwear Clothing Co.*, 201 *E. 34th St., New York City* 16. (140D)

Single-Strip Tape Sealer automatically tapes top and/or bottom flaps of cases at 25 per min.—*General Corrugated Machinery Corp., Palisades Park, N. J.* (140E)

Floor-Truck Trailer Wheels of lightweight aluminum alloy have demountable rubber tires. Available in 4 to 12 in. dia., 250 to 800 lb. capacity.—*Nutting Truck & Caster Co.*, 1201 *W. Division St., Faribault, Minn.* (140F)

Rotary Tray Dryer for fragile or heat-sensitive items employs intermittent piling and spreading action for uniform drying and high thermal efficiency.—*Wyssmont Co.*, 42-05 27*th St., Long Island City* 1, *N. Y.* (140G)

new horizons in **KRAFT** *packaging —*



WITH TOUGH-TEMPERED

FROSTKRAFT

FROSTKRAFT shipping containers and multiwall sacks are quality products made entirely from virgin fibers of the Southern Pine . . . the long, tough fibers preferred for maximum strength.

FROSTKRAFT quality typifies the Olin Mathieson Chemical Corporation's sixty years of leadership in cellulose chemistry, long experience in scientific packaging.

The know-how, experience and creative abilities of FROSTKRAFT engineers and designers are at your disposal. Our executives will be happy to help you reach the *right* solution — right away — to your kraft packaging problems.

FROSTKRAFT

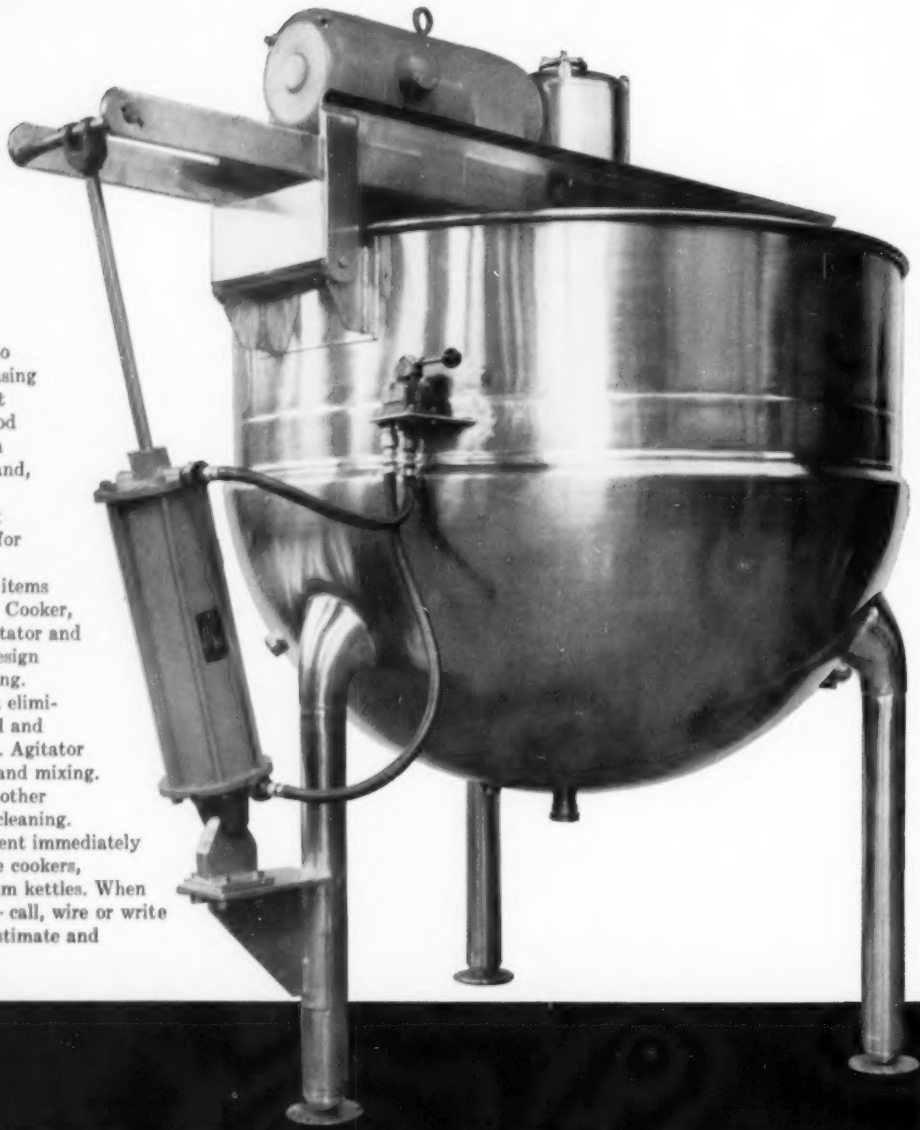
PAPER PRODUCTS

FOREST PRODUCTS DIVISION
OLIN MATHIESON CHEMICAL CORPORATION
WEST MONROE, LOUISIANA

When You Need a Kettle Quick!

HAMILTON

CG mix cooker



Seasonal demands force many of our customers to make last minute purchasing decisions and require fast delivery on orders for food processing equipment. In anticipation of this demand, we carry most of our standard kettles and mix cookers in stock – ready for prompt shipment.

One of these standard items is the Hamilton CG Mix Cooker, with Double Motion Agitator and Hydraulic Lift. Kettle design provides fast, even cooking. Streamlined construction eliminates crevices where food and bacteria normally collect. Agitator insures perfect blending and mixing. Hydraulic Lift gives smoother operation and simplifies cleaning.

Other types of equipment immediately available include pressure cookers, tilting kettles, and vacuum kettles. When you need a kettle quick – call, wire or write Hamilton – for prompt estimate and delivery information.

HAMILTON Copper and Brass Works

Division of Brighton Copper Works, 824 State Avenue, Cincinnati 4, Ohio

Air Compressor Problems

—Continued from page 63

chine to exceed the recommended 25 cfm. If you do, you will increase the discharge temperatures of your air and overheat the oil in the discharge to a dangerous point.

When installing an air-cooled unit, place where area is open so machine gets plenty of air circulation. If you don't have such a spot and the flywheel must be near a wall, be sure to place at least a foot from the wall. If possible, make it 18 in. and place a wire guard around flywheel. Then locate the machine's intake outside of the building—usually on the shady side where the air is cooler.

If your new compressor is over 15 ft. from its intake, use a larger intake pipe. Increase the pipe diameter 2-in. for each 15-ft. length. That means that a 45-ft. pipe will be 6 in. larger than a pipe a few feet long. This larger pipe is needed, because a long pipe offers more friction to the incoming air and makes the machine run much hotter. Also, the air is not as dense, and the compressor must run longer to do the same work.

Water-cooled compressors — I've seen many a water-cooled compressor where the cooling lines were almost plugged with mud and scale. This makes the machine run hot and wear fast—if it doesn't fail all of a sudden.

You can avoid this condition by inspecting and washing the compressor water jacket at regular intervals. Just make a nozzle of ¼- to ½-in. pipe for your hose. Stick it into the front and back of compressor, after removing cooling lines, and wash out the sediment.

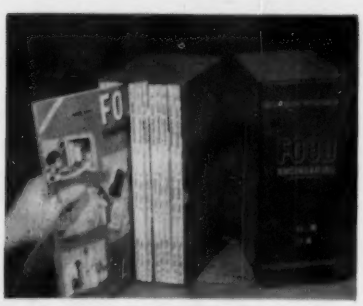
Scale in jacket—If your compressor cooling jacket has a heavy scale coating, you can remove it by circulating a 10 to 15% solution of muriatic acid through the jacket. Then flush it out with fresh water. But you must know what you are doing before you try this. Call in an expert.

Air leaks—Many plant air lines leak air. That is costly, because your compressor must run longer. Besides causing heating and excess wear, it also ups your electric bills.

One good way to find air leaks, regardless of how small, is to place essence of peppermint in your air system. Hold it under the suction strainer, or dump a little inside—just a few ounces. You can buy it at most drug stores. Then walk along your various air lines and let your nose find the leaks.

Some maintenance mechanics use a candle. They hold the light near the suspected air leaks and watch the flame. Another way is to coat the air-line joints with soap solution, then watch for air bubbles. Trouble is, you seldom hear air leaks. But they sure add up to a lot of lost energy.

End (Resume reading on page 64)



Permanent File for FE Is Now Available

Because many readers have learned that the best source for information on food manufacturing is a set of the back issues of FOOD ENGINEERING, this publication has given permission to the Jesse Jones Box Corp., of Philadelphia, Pa., to make and sell special file boxes that should facilitate orderly storing of issues. One box will hold a year's issues.

Each box bears the typical FOOD ENGINEERING name-plate stamped in gold on a green, leatherlike, plastic covering. And the box provides gold squares on which volume number and year can be written in ink. It is believed that most readers will find these gold-stamped, green and red boxes suitable for filing in book cases.

Since FOOD ENGINEERING publishes an Annual Index to its editorial content, a file of issues extending over several years will serve as an invaluable encyclopedia of modern food-manufacturing and packaging practices. For many busy men, this unmatched source of finger-tip information should save long hours of search and inquiry.

FOOD ENGINEERING derives no income from the sale of the boxes, and has made the agreement with the manufacturer solely for the convenience of its readers.

The manufacturer will charge $2.50 per box. Quantity prices are $7.00 for three boxes, for holding three years' issues, and $13.00 for six. For orders outside the U. S., $1. should be added for postage. Orders should be addressed to Jesse Jones Box Corp., Dept. FE, P. O. Box 5120, Philadelphia 41, Pa.—PUBLISHER

DARNELL CASTERS AND WHEELS

Always SWIVEL and ROLL

RUBBER TREADS . . . a wide choice of treads suited to all types of floors, including Darnelloprene oil, water and chemical-resistant treads, make Darnell Casters and Wheels highly adapted to rough usage.

RUST-PROOFED . . . by zinc plating, Darnell Casters give longer, care-free life wherever water, steam and corroding chemicals are freely used.

LUBRICATION . . . all swivel and wheel bearings are factory packed with a high quality grease that "stands up" under attack by heat and water. Quick grease-gun lubrication provides easy maintenance.

STRING GUARDS . . . Even though string and ravelings may wind around the hub, these string guards insure easy rolling at all times.

DARNELL CORPORATION, LTD.

DOWNEY (LOS ANGELES COUNTY), CALIFORNIA
60 WALKER STREET, NEW YORK 13, NEW YORK
36 NORTH CLINTON STREET, CHICAGO 6, ILLINOIS

New J-M

Proved in a bath of fire

The new J-M Rock Cork Insulation has passed the exacting Columbia Fire Test requirements contained in the National Bureau of Standards, Commercial Standard CS131-46. Under this test a flame from a gas-air burner impinges directly on the material continuously for forty minutes. Temperature readings are taken every two minutes and these must fall within 5% of the standard. In addition, J-M Rock Cork Insulation produced absolutely no flame, glow or after-smoldering.

Another FIRST from J-M Insulation Research

New Rock Cork is the latest development of the J-M Research Insulation engineers. Through constant research they are providing better ways to control temperatures from 3000 F heat to minus 300 F sub-zero cold.

Johns-Manville *incombustible*

Rock Cork Insulation

...Stops flame

Johns-Manville combines outstanding refrigeration temperature control with new fire safety in Rock Cork® Insulation

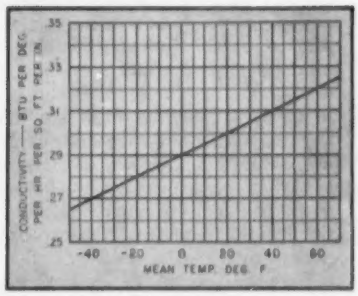
This revolutionary new improvement in refrigeration insulation, developed at the world-famous Johns-Manville insulation research laboratory, minimizes the ever-threatening hazard of destructive fires and assures fire safety for cold storage rooms of all kinds. It is made from an improved binder and naturally fireproof mineral fibres. Rock Cork successfully passes, with the highest *incombustible* rating, the Columbia Fire Test as defined by the Bureau of Standards.

For almost fifty years J-M Rock Cork has been one of industry's outstanding insulations for refrigeration service. Manufacturers and warehousers of food, dairy, beverage, ice cream and other perishable products have long recognized its outstanding ability to preserve and control cold. Long lasting too . . . many installations made more than forty years ago are still providing efficient economical service today.

Rock Cork is available in sheets and pipe insulation in standard sizes and thicknesses. For complete information on the latest development in refrigeration insulation, write to Johns-Manville, Box 60, New York 16, N.Y. In Canada, Port Credit, Ontario.

JOHNS MANVILLE JM PRODUCTS

ROCK CORK INSULATION



Low Conductivity. Rock Cork's low thermal conductivity provides precise temperature control and reduced operating costs.

High Moisture Resistance. Rock Cork can't absorb moisture, is unaffected by humidity and condensation usually present in cold storage rooms.

Sanitary. Inherently odorless, Rock Cork will not absorb or transmit the strongest odors, will not contaminate the most delicate foods.

Long Service Life. Rock Cork's effective life is measured in decades. It is designed for fast, easy application and is strong enough to form partition walls without additional support.

NEW PACKAGES & PRODUCTS

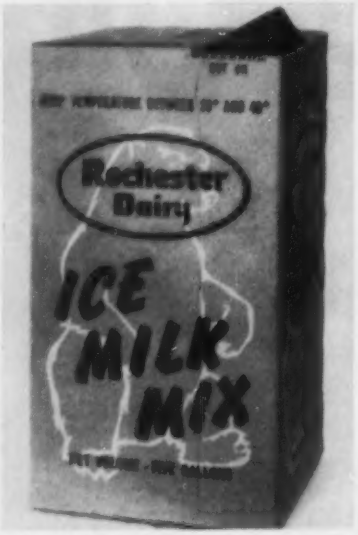
New Stabilized Box Board

Retarding rancidity of fats and oils, a new type of stabilized boxboard is being used by Maurice Lenell Cookie Co. of Chicago in folding carton trays. Developed by Robert Gair Co., it is particularly effective in packaging the processor's high butter content cookies.

Impregnated with an tasteless, odorless chemical by a special process, board inhibits rancidity of fats and oils which wick into it from the contents of carton through cut ends of the board. Shelf life of the package is thus greatly extended.

Exposure of oil to oxygen, often leading to rancidity, is increased when the oil penetrates the fibers of paperboard. Added to this is the influence of metallic traces in paperboard which normally accelerate the development of rancidity. Presence of a stabilizing chemical reduces the susceptibility of oils.

Circle 146A on Reader Service Card



CORRUGATED 5-gal carton developed by Rochester Dairy Cooperative.

POLY' bags seal out dust and odor, protect quality.

Poly'-Lined Cartons Used for Dairy Products

Standard ice cream and milk cans are being challenged by two newly developed corrugated board cartons. Both have film liners.

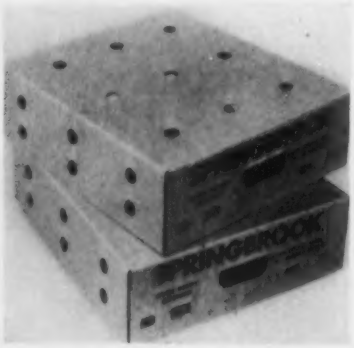
Rochester Dairy Cooperative, Rochester, Minn., is using a 5-gal. corrugated container for liquid dairy products. Eliminating heavy cans has resulted in a 35% reduction in personnel, increased truck hauling capacity of 40%, elimination of all washing and sterilizing problems, and increased storage capacity of 33⅓%.

Package was developed by the dairymen in consultation with Hoerner Boxes of Minneapolis, and packaging engineer L. H. Hildebrandt. Tall and narrow, container has a "pitcher-pour" corner. Liner is of polyethylene (146C).

The dairy's production equipment has been redesigned to efficiently handle the new containers, in use since June of last year. State health departments in areas covered by Rochester Dairy have fully approved the new plastic-lined corrugated containers. Polyethylene liners are sterile and entire filling operation is done by machine.

A similar corrugated box for cream is distributed by Langton Corrugated Container Machinery. Lightweight and sturdy, the carton holds 40 lb. of cream in polyethylene bags. Air dust and foreign odors are sealed out

(*Turn page*)



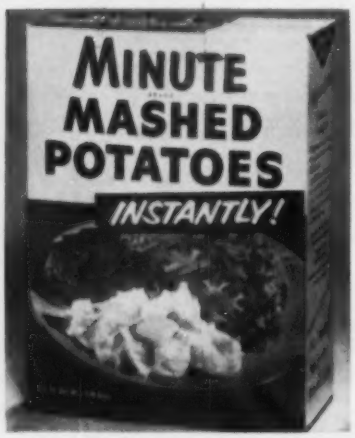
Rugged Chicken Shipper

Vertical strength, moisture resistance, and ventilation make up the features of a dressed poultry shipper used by Kissell Bros., Columbus Grove, Ohio.

Designed by Hinde and Dauch, shipper has a two-piece telescopic construction which gives double thickness to the walls, preventing crushing. Carrying holes in the top have flaps which fold in and lock top and bottom together.

In storage, moisture-resistant corrugated board and waterproof construction insure lasting solidarity. Uniformly spaced ventilation holes permit efficient circulation of cold air throughout the box without weakening it.

Circle 146B on Reader Service Card



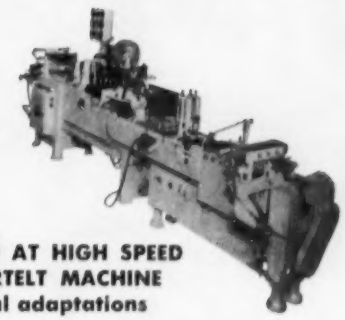
Instant Mashed Potatoes

Encouraged by consumer and retail acceptance of Minute Mashed Potatoes in test markets, General Foods has decided to expand distribution to central and western states. Each 3¾ oz. box contains four full servings of tender, precooked shreds of selected Idaho potatoes.

To prepare, consumer adds contents to two cups of boiling water. No cooking is necessary. Potatoes are pressed into the water with a table fork and then seasoned with butter, salt, pepper and whipped. Ingredients include anhydrated potatoes, non-fat dry milk solids, and emulsifier.

PROTECTED BY RIEGEL

PILLSBURY'S NEW KIT CAKE* PACKAGE CONTAINS FOIL BAKING PAN. BOTH FROSTING MIX AND CAKE MIX USE POUCHPAK*—MADE, LAMINATED, POLY-COATED AND PRINTED BY RIEGEL. *TM



PACKAGED AT HIGH SPEED ON A BARTELT MACHINE with special adaptations

Protecting the sales-winning qualities of fine products is only one of the many functions of Riegel papers. Saving money is important, too. Riegel does it for you by creating the right combination of the most efficient packaging materials . . . and by "tailor-making" the paper to run and seal at high speeds on your machines. Tell us what you want paper to do for you. Riegel Paper Corporation, P.O. Box 170, Grand Central Sta., New York 17, N. Y.

PROTECTIVE PAPERS FOR PACKAGING

Riegel

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and contamination from soiled cans eliminated. Insulating air spaces guard against heat and freezing cold. Each box reduces weight 13 lb. for every 40 lb. of cream. Langston manufactures machines (146D).

Similar polyethylene liners may be used in the standard milk cans. Closed by heat-sealing or clamp, the bags keep the milk from touching the metal can—even during pouring. Can cleaning is greatly simplified, emphasizing economy.

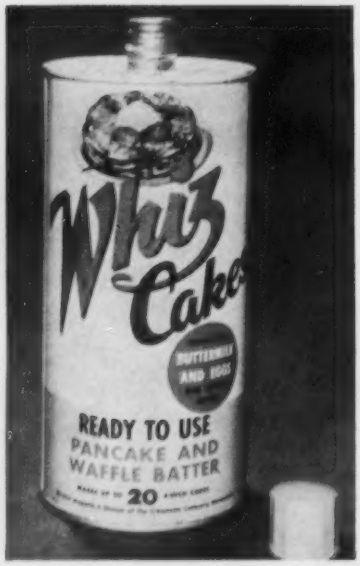
Two Bread Mixes

Recently introduced in the East are two new homemade bread mixes. Processors are the Flako Products Div. of the Quaker Oats Co., and Food Specialties, Inc.

The Flako product is a spoon bread mix developed primarily for southern markets. Eggs and milk are added in an easy one-pan mixing method. Each 8¼ oz. package makes enough spoon bread for 6 to 8 servings.

The Food Specialties product is marketing under the Appian Way label. Called Qwikbread, product comes in a package containing the yeast and newly-developed mix, as well as a reusable aluminum baking pan. Each package makes two loaves.

The mix need only be combined with yeast and water to make a dough. This is then put on a board, flattened out to a ½-in. thickness, rolled into a loaf, and placed in a baking pan. Kneading, therefore, is eliminated. A total of 10 min. for preparation and 1 hr. for baking is required before serving.

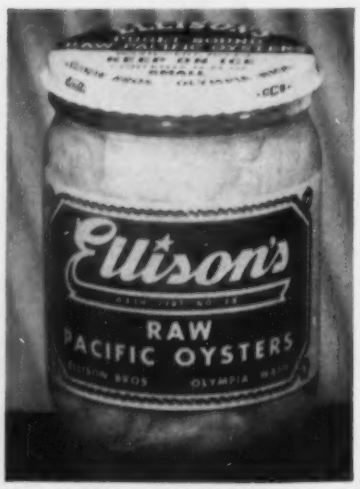


Canned Pancake Batter

Packaged in an aerosol can, ready-to-use pancake and waffle batter is being test marketed in the Minneapolis-St. Paul area by Creamette Co.

Called Whiz Cakes, the product is processed by the company's Whipette Div. Container is a 22 oz. American Can Co. non-drip can. Batter is made of water, wheat flour, corn flour, dry buttermilk, vegetable shortening, leavening, dried whole eggs, dextrose, salt and sodium benzoate. It will make up to 20 4-in. cakes.

Product should be refrigerated and may be kept for sometime in a freezer.



Scuff Resistant Label

Raw Pacific oysters packed by Ellison Brothers, Olympia, Wash., are packed in a glass jar featuring a moisture-resistant applied color label. Fused by heat onto the glass jar, the ceramic labels will not fade or scuff.

Front label carries product identification, while the back label features one of the packer's recipes.

The 12 oz. glass jars and two color applied labels are manufactured by Owens-Illinois Glass Co., San Francisco.

Circle 148A on Reader Service Card

New Coated Corn

A 4 oz. packet of coated corn which makes three quarts of pop corn is marketed by H. W. Lay and Co., Atlanta, under their Fun label. Nothing need be added to the corn in popping, since each kernel is coated with vegetable oil, lightly salted, and has artificial butter flavoring added.

Manufactured under process patents which are pending, product is prepared by placing it in a covered pot or pan for popping.

Windowed Carrier Box

Doubling as a counter display and carry-home carton is National Container Corp.'s new carrier. Made of B-fluted, white tinted, corrugated paperboard, the carton is windowed to give consumer a view of the cans label. Paperboard handle for carrying is thrust through the interlocking top of the box.

Circle 148B on Reader Service Card

Frozen Stuffed Turkeys

Quick-frozen stuffed turkeys ready to place in the oven without defrosting are a new product of Armour and Co. The turkeys are in junior sizes, 5 to 10 lb.

Result of intensive research by two

"You're looking at Cora Gated"

She's on the trucks
that deliver the boxes
that deliver the goods.
For quality corrugated, be sure
she's on the boxes you buy!

HINDE & DAUCH

Subsidiary of West Virginia Pulp and Paper Company

AUTHORITY ON PACKAGING • SANDUSKY, OHIO
13 FACTORIES • 42 SALES OFFICES

companies—Armour and Co., and Pepperidge Farm—the stuffed turkeys eliminate the 57 minutes ordinarily required of a housewife to make a stuffing and truss a turkey.

Pepperidge stuffing contains dried bread made of stone-ground flours, 93-score butter, and honey, as well as distinctive herbs and spices. Use of the Pepperidge stuffing is noted on the label.

Redesigned Coffee Jar

Recently introduced at retailers was Instant Maxwell House Coffee's bright "new look." Both 2- and 6-oz. jars now have high shoulders, making them appear taller with no apparent loss in diameter. The larger jar also features a taller cap which is easier to open.

Label improvements include use of instant as part of the brand name and a taller "M" in Maxwell for the large jar. A sunburst effect also emphasizes the "6 ounces" content.

Whiter Milk Carton

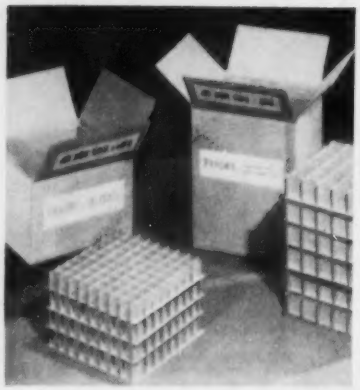
Reported to increase visibility of the label 25 percent over that of previous fiber materials, a "bright white" paper is being used by American Can Co. for its milk containers. The brighter hue of the carton increases sales appeal, particularly to women buyers.

The new carton is available nationally from plants in all three Canco divisions.

Circle 150A on Reader Service Card

Confetti Angel Cake

Newest Betty Crocker cake mix is Confetti Angel Food. Tiny colored sugar dots in the mix dissolves during baking and add a rainbow effect to the cake. Unusual cherry almond flavor is an added feature.



256 Quail Eggs by Parcel Post

A corrugated shipping case specifically designed for game bird eggs, is distributed by the Leahy Mfg. Co., Higginsville, Mo. Constructed of 200 lb. test material, the shipper provides excellent protection for the eggs. This was noted in a recent test shipment by parcel post, when 256 quail eggs were shipped from Joplin, Mo. to Higginsville without breakage. Cases are made in two sizes with different fillers that adapt the boxes for either pheasant or quail eggs. Manufacturer is Hinde & Dauch, Sandusky, Ohio.

Circle 150B on Reader Service Card

3 New Jello Flavors

Black raspberry, black cherry, and imitation grape have been added to the Jello dessert line, bringing the General Foods line to a total of ten flavors. The 3-oz. packages are labeled in colors that indicate contents.

New flavors are distributed singly and in a cello-overwrapped tri-pack.

New Product Shorts

Concentrated Frozen Orange Juice marks the entrance of Francis H. Leggett Co. into the frozen food field. Packed under the Premier Label, the juice is being test-marketed in Buffalo and Rochester.

Tumblers decorated with a Pennsylvania Dutch design are now used for C. H. Musselman Co.'s apple butter.

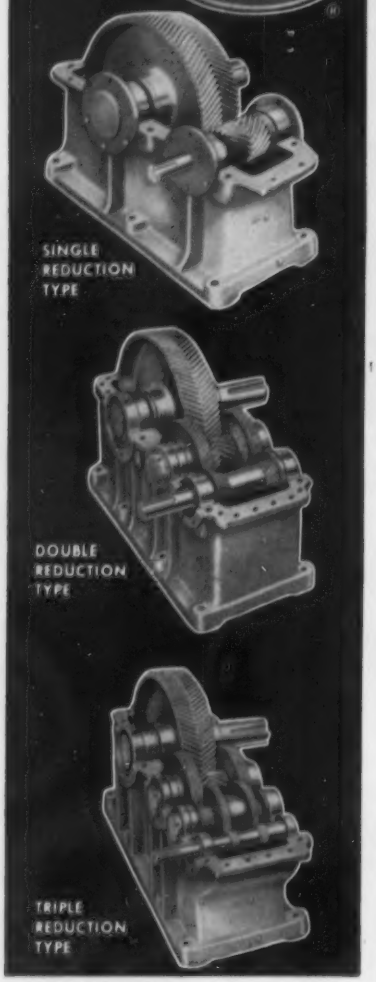
Junior Soup, vegetables and liver is newest dinner-type baby food distributed nationally by H. J. Heinz Co.

Foil Bag is the package for Brownie Baking Co.'s shortbread cookie.

Pure Florida Orange Juice packed in a quart size container is being marketed in the East under the Kraft label.

Carry-home Carton for frozen Minute Maid orange juice makes it easy to carry 6 cans. Package may be broken on a perforated line in the center to divide into three-can size.

HERRINGBONE REDUCERS ... by PHILLIE GEAR

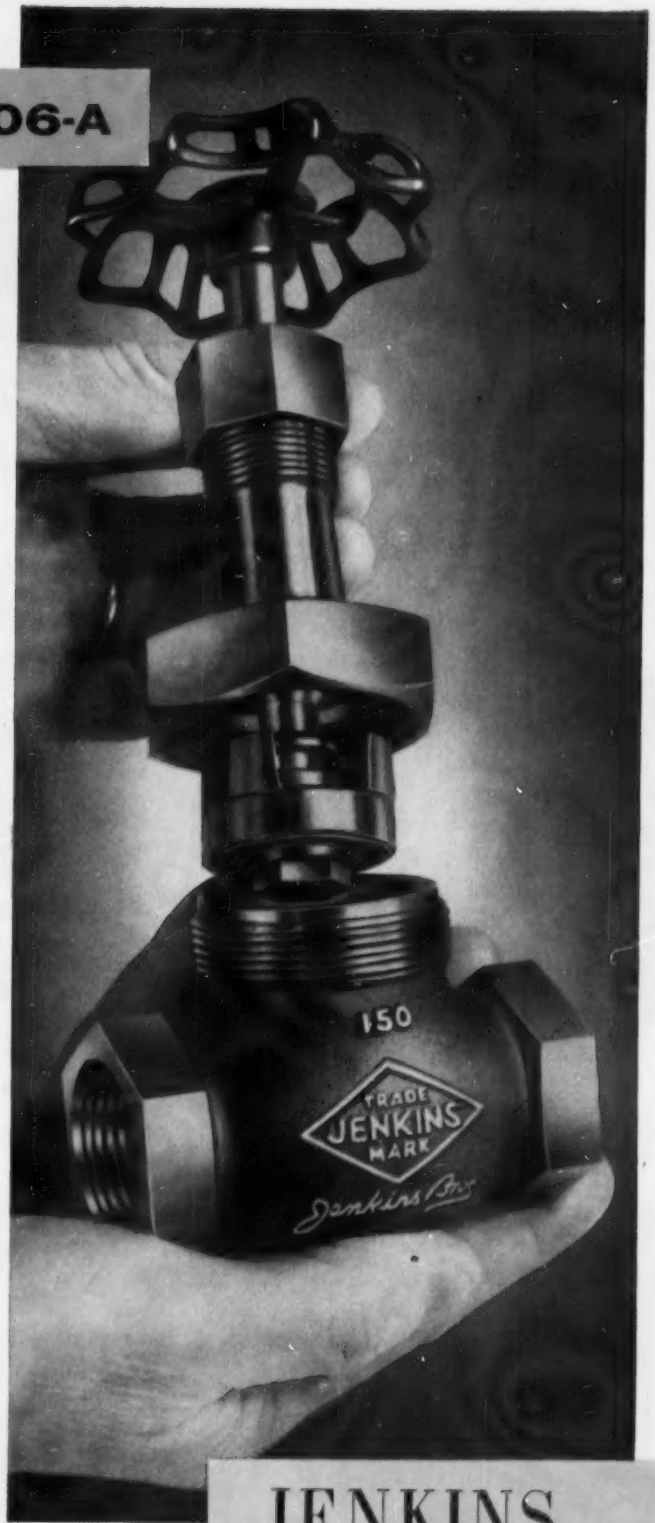


For high horsepower reduction with heavy shock loads, Philadelphia Herringbones are the answer. These quality units are available in Single, Double and Triple Reductions offering wide selection of capacities and ratios. Continuous tooth type herringbone gears assure evenly distributed pressure over each tooth from top to working depth line — which means long life, minimum vibration, quiet operation and maximum transmission . . . Be convinced, send for Catalog H-55.

PHILADELPHIA GEAR WORKS INCORPORATED
ERIE AVE. AND G ST., PHILADELPHIA 34, PA.
NEW YORK • PITTSBURGH • CHICAGO • HOUSTON • LYNCHBURG, VA.
BALTIMORE • CLEVELAND
Industrial Gears & Speed Reducers • LimTorque Valve Controls

JENKINS Fig. 106-A

The FIRST
Renewable Composition Disc
BRONZE GLOBE VALVE
150 lbs. Steam 300 lbs. O.W.G.
⅛ in. to 3 in.



Making a Work Horse a Champion

Take a Fig. 106-A apart. It's easy to see the reason why it's the "champion" of disc-equipped Bronze Globes. Every part, from heatproof handwheel to pipe ends, reflects the design and construction skill of generations of Jenkins Valve specialists.

Jenkins Bros. introduced the first renewable composition disc Globe . . . is still the only manufacturer of both valves *and* discs.

Fig. 106-A not only looks better — it proves out better in performance. In any comparison, its long-life, low-upkeep record has always set the standard. That is the true measure of valve cost — and it is the reason why industry's shrewdest buyers will settle for nothing less than Fig. 106-A quality.

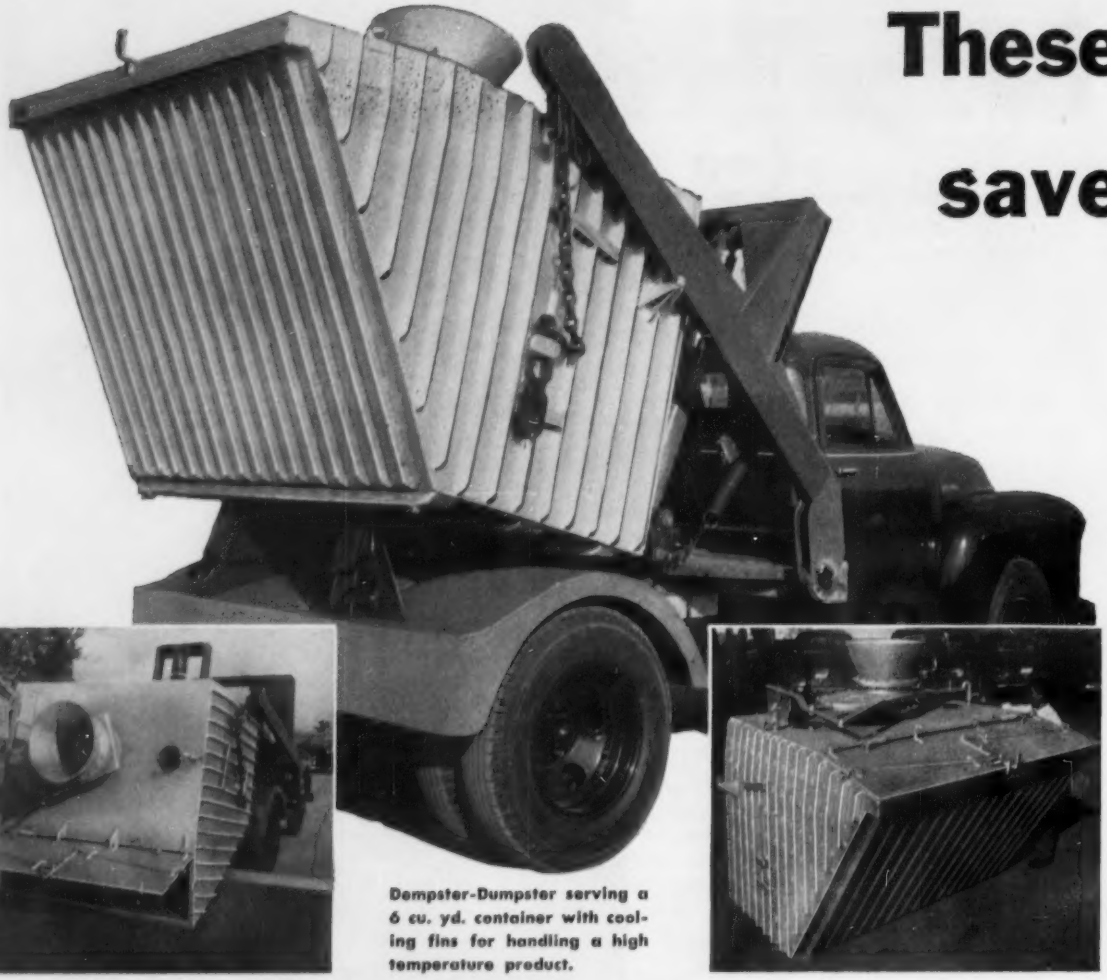
The Fig. 106-A "family", with interchangeable parts, provides Globe, Angle, and Check patterns to meet 90% of average valve needs.

Ask your Jenkins Distributor for full information, or write: Jenkins Bros., 100 Park Ave., New York 17.

SOLD THROUGH PLUMBING-HEATING AND INDUSTRIAL DISTRIBUTORS

JENKINS
LOOK FOR THE JENKINS DIAMOND
VALVES
SINCE 1864 TRADE JENKINS MARK
Jenkins Bros

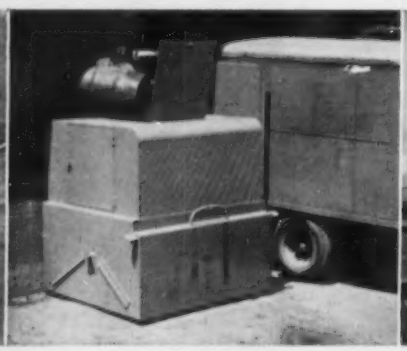
These save



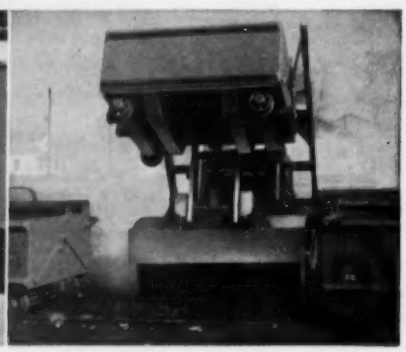
Dempster-Dumpster serving a 6 cu. yd. container with cooling fins for handling a high temperature product.

Here are a few of the hundreds of Detachable Containers we have built to solve handling problems of every description. A few others not shown include those with compartments . . . with insert containers . . . fully-insulated . . . lined with lead . . . lined with fire brick . . . with windows and doors . . . with casters . . . flat bottoms and open at one end . . . with teeth . . . with shelves for tools and supplies—and we could describe hundreds more, all served by one Dempster-Dumpster and only one man, the driver.

This 3 cu. yd. Container has skids for fork lift truck transfer.



10 cu. yd. Container widely used for refuse and combustible wastes.



Flanged wheel equipped containers for remote loading.

5176

DEMPSTER

4 manufacturers to $82,000.00 annually handling waste materials!

These four industrial plants expect to save, in labor costs alone, during the first five years service of the Dempster-Dumpster System—

A PLASTICS PLANT: $26,958.00 savings on an investment of $9,523.50 in Dempster-Dumpster equipment. Savings alone pay for equipment in two years.

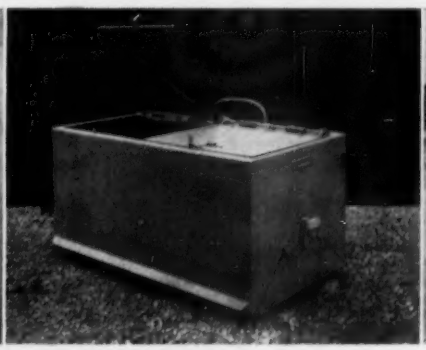
A CHEMICAL PLANT: $204,076.75 savings on an investment of $40,968.00 in this equipment . . . savings pay for equipment in one year.

AN AUTOMOTIVE PLANT: $135,000.00 savings on an investment of $19,272.00 . . . savings pay for equipment in 9 months.

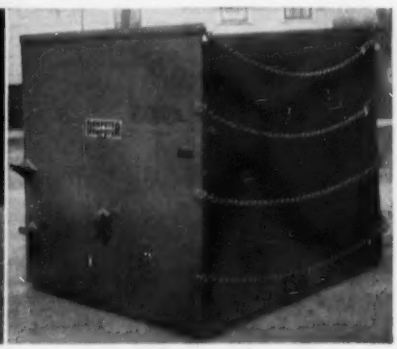
A PAPER AND PULP MILL: $43,104.00 savings on an investment of $10,750.00 . . . savings pay for equipment in 1¼ years.

Those are typical examples. Visualize a Dempster-Dumpster, operated by only one man, the driver, serving scores of big steel containers, one after another, in your plant. Containers of many designs and types, handling waste or salvable materials, raw or finished products, fluids including acids, combustibles, dusty materials—anything that can be handled in up to 21 cu. yd. detachable Dempster-Dumpster Containers . . . payloads up to 19 tons. Savings are tremendous! Take advantage of our free engineering service, which determines by fact-finding survey the cost cutting possibilities of this system in your plant. Dempster Brothers, Inc.

600 Gal. stainclad tank with brine cooling channels.

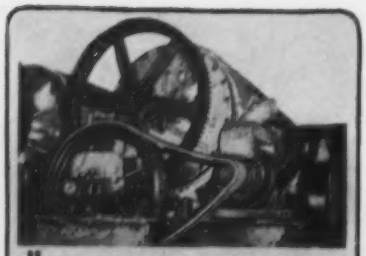


A Container available up to 10 cu. yds. with or without lids for many uses.



A 9 cu. yd. container for handling packaged products.

BROTHERS 726 SHEA BLDG., KNOXVILLE 17, TENNESSEE



"THIS LUBRICANT INCREASED CHAIN LIFE 4 TIMES"

—says FASTERFAT, Division of National Sea Products Limited

"Two years ago we switched from the lubricant we were then using to your LUBRIPLATE, and we are pleased to inform you that we have had very excellent satisfaction from its use. High speed silent chains on the drives of our fish meal cookers, which were formerly worn out in about six months, are still in service after two years."

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE

LUBRIPLATE LUBRICATION

MAKES CARS AND TRUCKS RUN BETTER AND LAST LONGER

LUBRIPLATE H.D.S. MOTOR OIL . . . THE OIL THAT NEEDS NO ADDITIVES

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK" . . . a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.

Revamped Plant Lines

—*Continued from page 73*

hours are staggered (see table). Also, consideration is given in this programming to those lines where a backlog of raw materials is necessary to insure a constant product flow (as in sausage kitchen and canning lines).

In all cases, flexibility is built into the schedule, enabling quick extension of production hours when the plant is faced with unexpected orders.

Trucks are equipped with a variety of refrigerating machinery to meet route delivery conditions. Short-haul carriers have cold plates that are ammonia charged in the company garage. For trucks making 2-day runs, motor-driven compressors are installed under the bodies. These can be plugged-in to outside power sources at overnight truck stops. The company also uses self-contained gasoline-driven units and plug-in-and-power-take-off systems on trucks slated for long hauls.

End (*Resume reading on page 74*)

Bulk Sugar Trailer

—*Continued from page 95*)

a 6 psi. pressure and transport sugar at approximately 6,500 ft. min. Wherever feasible, bins are located at an elevation permitting gravity handling of sugar to process points.

A 6-cyl., 100-hp Chrysler gasoline motor—governor-controlled and operating at approximately 2,500 rpm.—drives the two positive displacement Michl Dexter aluminum blowers. The motor is connected to each blower by four "V" belts. These 2,000 cfm. blowers are located on each side of the center line of the engine shaft.

When unloading, there is a pressure of 3-6 psi. at the hopper discharge gate. A second duct, from the blowers to hoppers, equalizes this pressure, so sugar flows easily from discharge gates. Hoppers are lined with one coat of ABC primer and three coats of Tropelite. They are accessible from five manholes, or filling ports, located at the top of the unit. Discharge gates are rubber, plunger-type valves, controlled manually from the outside of the trailer.

Has Dust Collector

The conventional type dust collector, located at the rear of the unit, consists of 90 dust bags. Return air, from customers' bins, enters the bottom of the collector, where the reduction in air velocity drops sugar dust into a clean-out compartment. Powdered sugar, collected on the fabric bags, is removed manually by vibrating the bag shaker. Filtered air, having passed through the dust bags, returns for recycling to the intake side of the air compressors. An air vent is located just atop the dust collector to provide make-up air to blowers, compensating for bin, line, and compression losses. Blow-off valves, preset at 10 psi., are on the outlet side of each blower. In case of line-clogging, these valves open to protect the equipment from damage. One is connected mechanically to the engine-clutch lever. It acts as a blow-off for hoppers after a delivery is completed.

A check valve is located just before the first discharge gate to prevent sugar blow-back into the compressors in case of engine failure. Another check valve in the main delivery duct maintains pressure on the discharge gates during tank blow-off and keeps the discharge gates clean.

Gages Tell All

A combination vacuum-pressure gage, located on the rear dust collector door, indicates the back pressure of the dust collector and return air lines.

There is a pressure gage on the air-duct near each dump gate to indicate any mal-function. Low pressure indicates air flow only; medium pressure, air and sugar flow; high pressure, too much sugar; very high pressure, clogged line or full bin.

Two pressure gages are placed above the gas engine instrument panel. They indicate the pressure in the tank and the blower pressure. When these pressures are equal, the unit is ready to make a pneumatic delivery.

Trailer chassis were supplied by Utility Trailer Co. The product tank was fabricated by Industrial Tank Co. And pneumatic engineering and fabrication were done by Vacu-Blast Co., Inc. All are in the San Francisco Bay Area.

End (*Resume reading on page 96*)

Waste Yeast Converted

—*Continued from page 65*

production of cubes. Powder is packed directly by a company-built unit that requires one operator. One kilo (2.2 lb.) of dried soup makes 250 servings.

The cube-making machine turns out 150 cubes per min., each being about ¼-in. square and weighing 4g. Packaging of the cubes requires three employees, two for operating the two

machines used and one for hand-packing of the tin containers.

The first unit (Schweizische Industrie Gesellschaft, Neuhausen/Reinfall, Switzerland) wraps each cube in gold foil. The second machine, company designed, packs five of the wrapped cubes into a single package. Tins hold 50, 100, or 500 cubes.

Dried Yeast

For production of dried yeast, the spent yeast from storage goes to a roller-dryer (Mitchell Simon & Sons Ltd., Birmingham, England). This unit has a capacity of 110 lb. per hr., and is used also for drying of medicinal yeast. This product, however, is first debittered by a special process developed by Vitamon.

Fodder yeast, after drying, is milled into powder and packed in 50-lb. bags. It is sold chiefly to feed distributors and finds its largest market where a high-vitamin diet is important. It is also used by feed manufacturers as a cattle-feed additive.

End (Resume reading on page 66)

Spray Drying Advances

—Continued from page 78

powder, plus 90 lb. of powder fines that are reprocessed.

Essential spray dryer element is the Nerco-Niro atomizer manufactured in Denmark. All other equipment elements are standard, being obtained locally or fabricated here from designs of Nichols Engineering and Research Corp., New York, which engineered and built the Boonton plant.

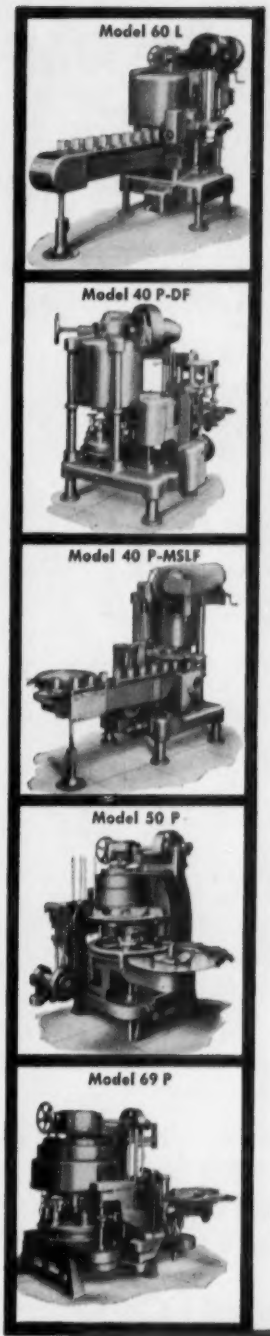
Wide Application Seen

Norda, Inc.—viewing optimistically the potential of its new plant and of the type of spray drying employed—considers the possibilities almost unlimited:

"In the near future, Norda expects to offer spray-dried genuine fruit flavors with a life of several years—and spray-dried fruit juices with flavor quality almost indistinguishable from fresh fruit juice, and possessing a shelf life far beyond anything known at present.

"Norda also will offer whole spray-dried powdered fruit, useful for many new and practically unheard of applications in packaged food products. It is the company's expectation that not only will the flavor industry experience a revolutionary change, but also that other related industries will benefit by advances now being made in the use of spray-dried products."

End (Resume reading on page 81)



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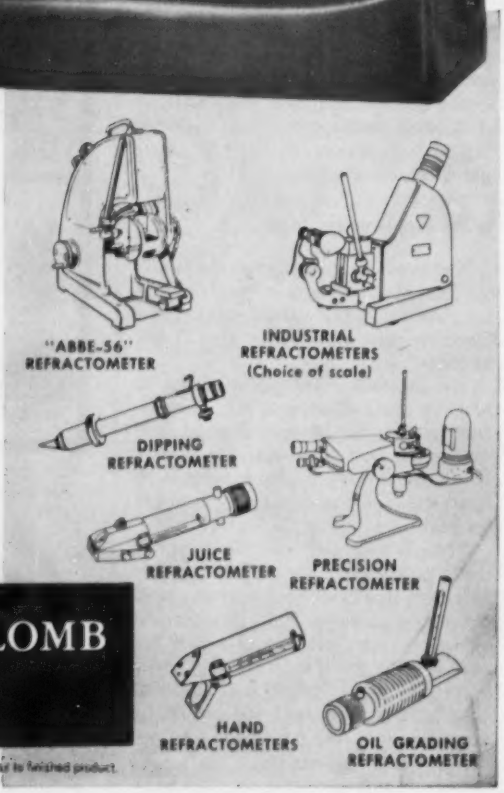

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Quick-Cooking Rice

Commercial production of precooked rice without sustaining prohibitive cooking losses is the basis of a recently patented process.

Product is readily reconstituted, has excellent keeping qualities, and texture of the individual grains is uniform from center to surface.

Principal steps of the process comprise: (1) Heating partly hydrated rice in absence of excess water so as to cause some gelatinization of the starch; (2) further hydrating to increase moisture content and enlarge grains, at the same time completing gelatinization, and (3) drying to a stable moisture content under conditions that will yield large porous grains.

For example, rice is soaked in water at room temperature for 30 min. and drained. It is then cooked for 45 min. by passing saturated steam at atmospheric pressure upwardly through a bed of rice. With the moisture content now about 30%, the rice is resoaked in water at 100 F. for 30 min, with gentle agitation. After draining, product has a moisture content of about 61% and volume about 3½ times that of the raw rice.

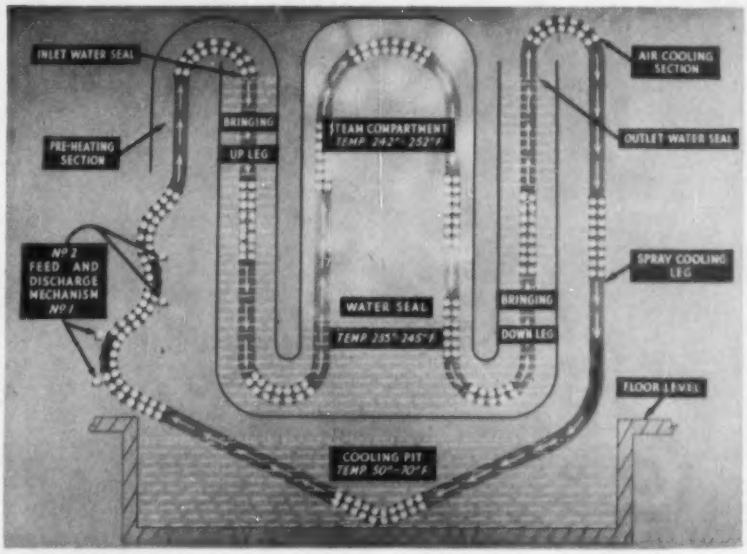
It is now dried in a layer about 1-in. deep by a current of air at 285 F. and a velocity of 500 fpm. Final product has a moisture content of 11% and a volume of 2.2 times that of the raw rice.—U. S. Patent 2,720,460, Oct. 11, 1955.

New Method for Detecting Foreign Flavors in Foods

A single-sample taste method of detecting foreign flavors in food products has been found superior to the triangle difference method, at least for some types of flavors.

Apples treated with demeton, and juice prepared from demeton-treated apples were submitted to both tests. The single-sample method showed that the products had a detectable foreign flavor, whereas results of the triangle difference method on the same series of juice samples were inconclusive.

The method is based on the assumption that a foreign flavor is of no consequence if experienced tasters cannot detect it in a series of single, adequately spaced tastes in which treated and untreated samples are offered at random.—*Food Technology*, 572-75, Nov. 1955.



Hydrostatic Sterilizer of New Design Gives Higher Quality Canned Foods

A new sterilizer of canned foods, operating at speeds up to 600 cans/min., employs no mechanical valves to the pressure vessel, and no sudden changes in temperature or pressure occur on the inside or the outside of the cans.

Cans enter and leave steam compartment through U-shaped columns of water, the height of which exert pressures at the base equal to the pressure existing on the inside of the steam chamber.

Experience with the method proves that it is superior to traditional systems in: (1) Quality of pack; (2) capacity and range of can sizes handled; (3) economy of steam and water; and (4) mechanical reliability.

Cans are conveyed through the machine by an endless chain carrier, each loop of which is driven by interconnected gears mounted at the top of the sterilizer. All bearings are external, so that lubrication presents no problem.

Cans are fed from the seamer at 170 F. and enter the preheater section where they are heated to 185 F. They then enter the water seal, at approximately the same temperature, and pass through increasing temperature and pressure until they enter the steam chamber which is held at 242-252 deg. F.

In this chamber they are held at the required temperature for a specified period of time, then pass into the water seal where the temperature is gradually reduced.

This is followed by air cooling, spray cooling, and final immersion in water in a cooling pit. Cans are discharged from the conveyor at a temperature of 95-100 F.—*Canning and Packing*, 6-7, Nov. 1955.

Detecting Spoilage Enzymes In Cucumber Brines

Tests have been devised for detecting pectinolytic and cellulolytic enzymes that cause the spoilage known as "softening" of commercial cucumber salt-stock.

For the pectinolytic enzyme, the following 3 steps are employed: (1) Dialysis of brine sample; (2) preparation and measuring the flow time of Ostwald-Fenske viscosity pipettes with pectate solution and dialyzed sample, and (3) calculation of softening activity units.

At least three tests should be made. The first (1-4 days) gives an early forecast of the enzyme activity brought into the vat on cucumbers and other

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materials. The second (10-14 days), third (more than 30 days) and fourth are important because softening agents are more constant during this period.

Procedure for the cellulolytic enzyme test is similar, except that in step (2) carboxymethylcellulose is substituted for the pectate solution. The same technique is used for converting loss in viscosity to cellulolytic activity units.

Good correlation has been found between enzyme activity units and firmness of cucumber salt-stock when the latter is measured with the USDA fruit pressure tester.—Pamphlet ARS-72-5, Agricultural Research Service, USDA.

Controlling Sulfur Content Improves Apple Slices

Dehydrofrozen apple slices can be prepared free from internal browning and containing as little as 40 ppm. SO_2 if special attention is given penetration of sulphur to the center of a slice and if surplus SO_2 is removed in the drier.

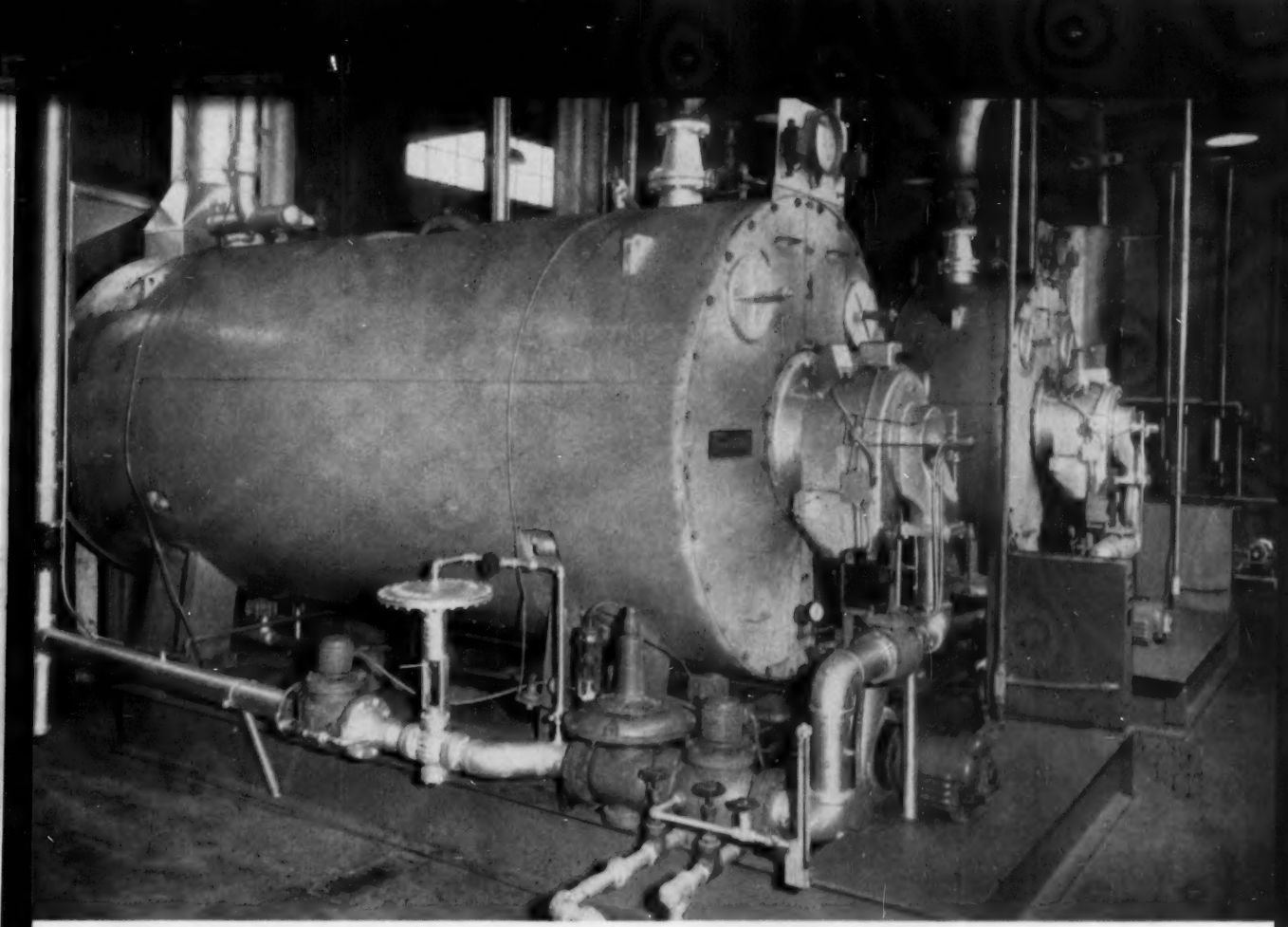
Penetration is influenced chiefly by events in the sulfite tank. Removal of surplus SO_2 is influenced chiefly by events in the drier.

A study was made of the effect on penetration of time and concentration of solution, effect of solids build-up in sulfite tank, and pH of the sulfiting solution. Minimum treatment to prevent browning was determined for 4 varieties of apples and was found to range from 2.0-2.5 min. in a bath containing 0.4-0.6% SO_2.

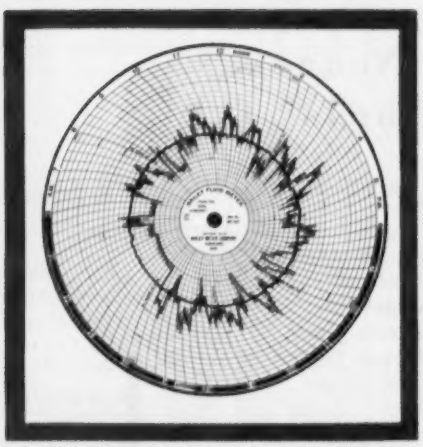
Solids build-up in the tank reduced rate of penetration and required compensatory increase in concentration of SO_2. Penetration was more rapid with sulfurous acid solutions than with other types of SO_2 and at low pH values. Degree of penetration is proportional to vapor pressure of SO_2 at solution boundaries which, in turn, is inversely proportional to pH of the solution.

Removal of surplus SO_2 in the drier is mainly influenced by relative humidity and surface texture of apple slices. Relative humidity in the range of 25-30% offers the least barrier to escape of SO_2 from the slices. At lower values rate of surface evaporation is faster than rate of diffusion of moisture through a slice, and a dense surface is produced that is less penetrable to SO_2.

In sulfiting slices it is essential that they receive uniform treatment in the tank. This is best obtained by installing a belt so designed that slices are held beneath the surface.



Powermasters Give Dairy Round-the-Clock Reliability



This 24-hr. pressure and flow chart shows the ability of the *Powermaster* to hold constant pressure under widely varying steam flow conditions. The basic simplicity and rugged construction of the *Powermaster* modulating burner control promptly adjusts fuel firing rate to steam demand, thus, automatically holding boiler pressure constant throughout the entire steam demand range of the boiler.

● These two *Powermaster* Packaged Automatic Boilers operate 24 hours a day, seven days a week in a West Coast Dairy. Since installed over three years ago, they have been shut down only for routine inspection and servicing. That's cost-saving dependability!

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MORE than operating dependability and efficiency are secured with completely factory-assembled *Powermaster*. Space-saving compactness, simple installation, automatic time-saving operation, maintenance-saving accessibility, fuel flexibility and O&S responsibility for the complete unit are other reasons why *Powermaster* is a wise boiler investment for food plants or any other industries. Call in a *Powermaster* representative for full details. Request Bulletin 1220.

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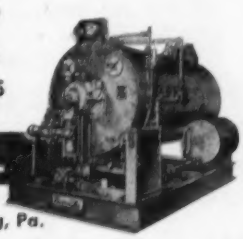

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Rate of passage can be altered by changing speed of belt. Space and cost factors indicate that apple slices can be dehydrated most economically in a bed several layers deep in a continuous dryer.—*Food Technology*, 576-82, Nov. 1955.

Corrosion of Tin Cans By Acid Foodstuffs

That tin is anodic to the steel base of an unlacquered tin can has long been known, but explanation of this "inversion" has never been very satisfactory.

If potentials are calculated for weakly acid solutions, using solubility products of stannous and ferrous hydroxides to obtain concentrations of reduced tin and iron ions, tin assumes a more electronegative potential than iron. This behavior is due to the low solubility of stannous hydroxide.

Amount of hydrogen in a tin can of mildly acidic food is usually lower than the quantity corresponding to the iron and tin removed from the can.

Since stannous oxide can be reduced to tin by nascent hydrogen, it seems likely that part of the hydrogen evolved when the tin dissolves is used to convert the stannous hydroxide back to tin.

The spongy tin formed is detached from the steel base, and increases the tin in the can contents. A hydrogen deficit also occurs with respect to the tin removed from the can.

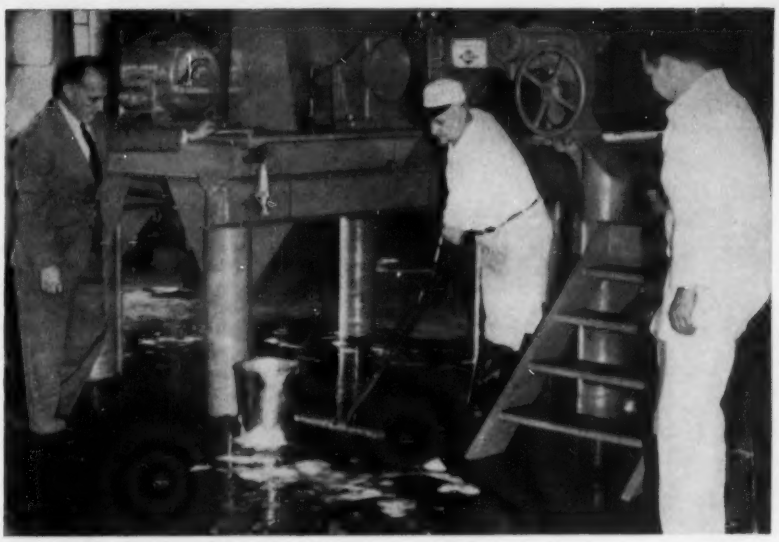
Caramelized dextrose greatly accelerates corrosion of tin plate by acid fruits. This is not true of caramelized sucrose, which has no such action on tin plate. Presence of reducing groups in the molecule may be a factor in this property.—*Journal of the Science of Food & Agriculture*, 652-55, 1955.

Chemical Changes In Beef-Curing Brines

Brines used for the curing beef eventually develop bacterial populations that divide them into three types.

Type A brines have a halophilic Gram-negative rod of the genus *Achromobacter* that converts nitrites to nitrogen more rapidly than nitrites are formed. Amines accumulate in the brine, the acidity decreases, precipitation occurs, and the brines take on such abnormal odors that they become unusable though good cures are obtained.

In Type B brines there is an accumulation of Gram-positive cocci which are unable to oxidize lactate



How processor takes the hard scrubbing out of cleaning

Clean-up men report Oakite Composition No. 67 saves effort—provides cleaner surfaces

At a large candy plant, as in all well-run food plants, cleanliness was strictly enforced. It meant continual, laborious scrubbing with brushes and cleaners to remove dirt, grease, drippings and sticky soils.

When asked for his advice, the Oakite Man suggested a trial of Oakite Composition No. 67. A few days' use told the story. Two typical applications illustrate the remarkable improvement. (1) After only a short soak in the Oakite cleaning solution, followed by a light brushing, pans were turned out cleaner than ever before. No longer did grease come to the top of the solution to contaminate cleaned surfaces; and no longer was hard scrubbing needed. (2) When applied to the tile floors, the Oakite solution proved equally effective. The man had only to apply the solution, let it soak, then mop it up.

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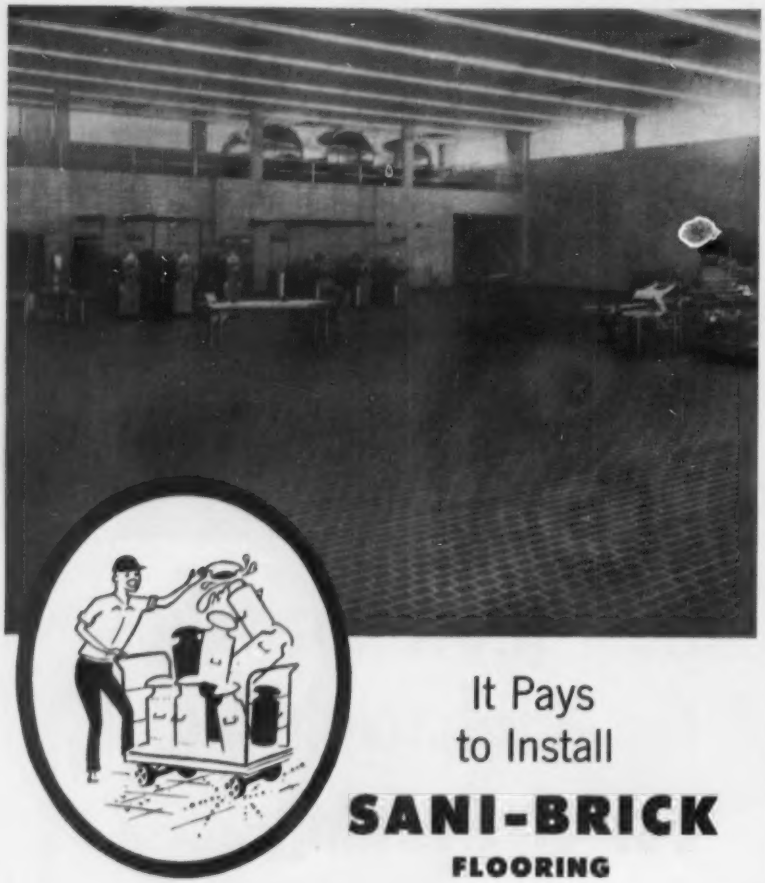

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or reduced nitrites. These constituents increase, and the brines become acid and take on the typical methemoglobin brown color.

Type B microorganisms prevent growth of Type A bacteria, the brines never take on an "off" odor, and they keep indefinitely, but their curing properties are poor.

Type C brines are inhibited by large Gram-positive spheres that produce acid only from sucrose and mannitol, and reduce nitrates to nitrites. These brines frequently have the green color associated with high nitrite content. They are found only rarely, but the organisms are sometimes found in Type B brines, and here their nitrite-producing powers have a beneficial effect.—*Journal of the Science of Food & Agriculture*, 705-15, 1955.

Meat Tenderizing Machine

Novelty and improvement are claimed for a patented meat tenderizing machine in which pieces are passed between knife rolls mounted on revolving shafts.

Rolls are contained in a housing and revolve inwardly toward each other, so that, as a piece of meat is passed downwardly between them, the teeth cut into it and break up the tissues.

Toothed rolls are so mounted on the shafts that the teeth of one roll overlap and pass partly between those of the other roll. So-called strippers are provided that prevent teeth from tearing the tissues apart and clogging the rolls.

Each knife roll assembly can be removed separately from the housing for cleaning or repair. The device is manually operated by a handle attached to the end of one of the rolls, both of which have meshing gears.—U. S. Patent 2,718,028. Sept. 20, 1955.

Egg Color Is Evaluated In Terms of Carotene

Lack of uniformity in methods for evaluating egg color has led to an attempt to put this evaluation on a more rational and uniform basis without requiring new or special instruments.

Crux of the new procedure is use of carotene instead of potassium dichromate for color comparison. Data obtained from the two methods show: (1) Marked variation in values for egg color when measured at different wave lengths and expressed in terms of potassium dichromate; (2) effect of differences in instrument characteristics, as shown in measurements with the Photelometer and spectrophotome-

INTERVIEW *with frozen storage plant executive* ALBERT I. RIS

How Berkshire Frosted Foods solved these 5 major cold box problems with Armorply

Unit eliminates crowding, dampness, loss of cold, vermin, high power costs

Q. What were you looking for when you first considered Armorply for your frozen storage plant?

A. We needed a low-cost, leakproof, verminproof, sweatproof unit that would hold the temperature at 0° and could be expanded for future growth.

Q. That's a big order—didn't the storage space you were using have any of those advantages?

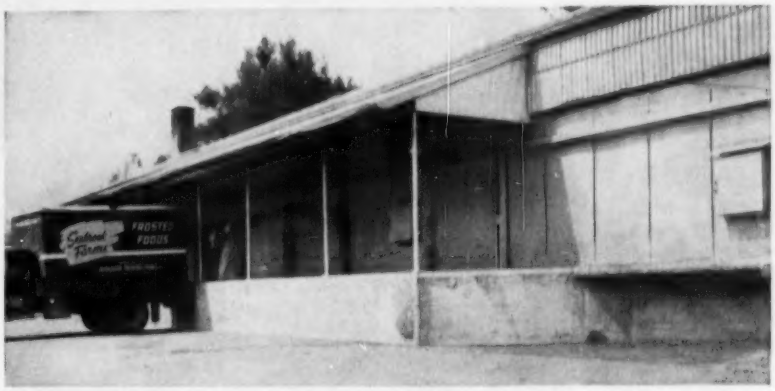
A. No. We were renting space then and it was awful. One place was tiny and had a sweating cork lining. Before that we were in a soggy, vermin-infested subbasement with temperatures up to 18°. Finally we decided to build our own cold storage plant.

Q. Having no experience with a frozen storage setup of your own, how did you go about your plans?

A. I visited other people's plants. One operator was particularly enthusiastic about how simple and inexpensive his unit was to build and operate. The cold box's metal-clad sides were the outside walls of the plant, it was completely leakproof and as clean as your own kitchen. It was the first Armorply installation I'd seen. We purchased our room from the Freezer Box Division of Annapolis Yacht Yard, Annapolis, Md.

Q. How large was the Armorply cold room you decided on?

A. 60 by 60 by 10 feet, and frankly, we didn't think we'd ever fill that 36,000 cubic feet. Now we've had to expand it with a 40-foot extension. I'm sure we couldn't have been as successful under the conditions we put up with when we rented freezer space.



Simple construction keeps initial outlay to a minimum. Strong Armorply walls become the plant's walls, need no protection from the elements. Metal surface reflects heat away, helps temperature control. Room supplied by Freezer Box Div., Annapolis Yacht Yard.

Q. How has your Armorply frozen storage room helped you cut operating costs?

A. For one thing, Armorply's metal surface reflects heat away, helps us keep power costs down. And the expense caused by vermin, dampness and spoilage has been completely eliminated.

Q. Did this expansion you mentioned cause much trouble or expense?

A. Not at all. We hired three unskilled workmen, gave them ratchets and had our general foreman boss the operation.

Q. What about maintenance or replacement of Armorply panels?

A. We haven't spent a cent on maintenance *or* replacement of Armorply since we put the unit up in 1951.

* * *

Armorply is waterproof plywood with a metal face permanently bonded on either or both sides. Possible metal faces include steel, stainless steel, monel, aluminum, lead, copper, and others. It's lightweight, verminproof and impervious to moisture, remarkably strong and very easy to fabricate. Send the coupon below for more information.

Expanding is easy because Armorply panels are bolted together in seconds. When cut-outs for bolts are re-covered, you have a smooth, easy-to-clean surface. This is interior of Berkshire Frosted Food's new extension in Pittsfield, Mass.

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303	18	8	S or Se	Free-machining
304	19	9	.08% Max. C	Welding
316	18	12	Mo	High Corrosion-Resistance
304 LC	19	9	.03% Max. C	Used where intricate welding is required
316 LC	18	12	Mo Low C	Used where intricate welding is required
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ter at 410μ, and (3) the lack of concordency between Photelometer and spectrophotometer results at 455μ, the region best suited for measuring egg color.

The spectral transmittance curves of carotene are almost identical with those of egg color. It should be possible, therefore, to measure egg color in the region of 455μ with different instruments and obtain practically the same results. This was found to be true.

Complete directions are given for preparing standard solutions, calibrating instruments, and making final calculations.—*Food Technology*, 565-68, Nov. 1955.

Indirect Method Predicts Pigment in Macaroni

Experimental work has developed a simple prediction test that allows one to estimate macaroni color from a 20g. sample of wheat or semolina.

Originally it was thought that a direct correlation should exist between semolina pigment and macaroni color. It was found, however, that some semolinas bleached badly during processing. Later it was established that durum wheats contain lipoxidase, that was responsible for pigment loss in semolina during processing. It was further shown that the quantity of this exzyme is a varietal characteristic and that environment has limited effect.

Because of the slight effect of environment it is possible to distinguish, in a general way, between good and poor varieties of durum wheat by lipoxidase measurement alone, even though they come from different areas of varying growing conditions.

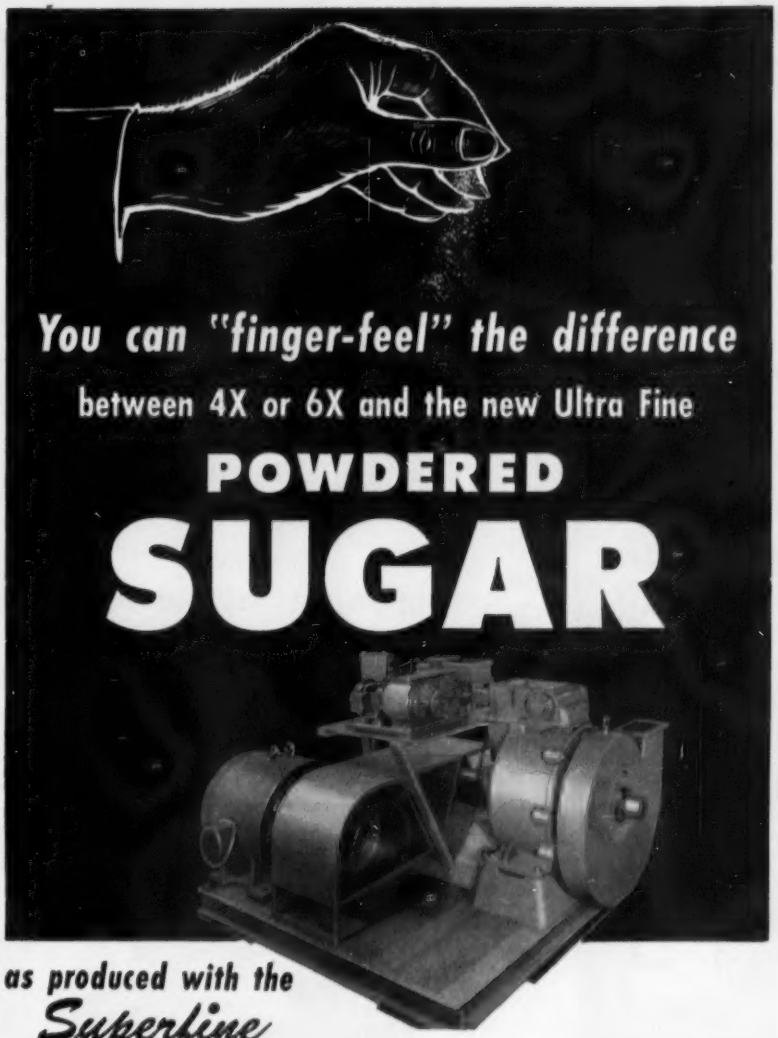
Subsequent experiments were made to see if it were possible to predict the amount of pigment in macaroni by measuring, not only the pigment content of semolina, but also its lipoxidase activity.

By using both sets of data a multiple regression can be calculated, relating macaroni pigment to both semolina pigment and semolina lipoxidase. This yields an equation from which macaroni pigment can be predicted from the other two measurements. Prediction equation is:

$P_m = 0.669 + 0.726P_s - 0.042L_s$

where P_m is the predicted macaroni pigment in ppm.; P_s is semolina pigment in ppm.; and L_s is semolina lipoxidase activity calculated a μl. of oxygen per min., per g. of semolina. This type of prediction test should be useful to mills and to purchasers of semolina products.

Applying the same multiple regres-



THE NEW, FINER GROUND POWDERED SUGAR introduced in recent months has been received with great interest. Products containing powdered sugar can be up-graded with the new ultra fine sucrose. The advantages of this new grade of powdered sugar are: smoother, creamier textures—elimination of coarse, gritty particles—faster dissolving—and easier blending.

SCHUTZ-O'NEILL IS PROUD to have their SUPERFINE Pulverizer in use for the production of this new powdered sugar. This pulverizer will deliver powders to almost any desired degree of fineness, and is manufactured in six sizes using 7½ to 125 H.P. motors to meet most production requirements.

POWDERED SUGAR IS BUT ONE of the many food products manufactured with this machine. Cocoa powder, vegetable gums, Irish moss extracts, specialty grain flours, spices, and various dairy products, such as cheese whey, can be pulverized with the Schutz-O'Neill SUPERFINE. Write us for detailed information.

ESTABLISHED 1893

SCHUTZ-O'NEILL COMPANY

309 PORTLAND AVE., MINNEAPOLIS 15, MINNESOTA

PULVERIZERS
GRANULATORS
ROLLER MILLS
AIR CLASSIFIERS
SIFTERS
HAMMERMILLS

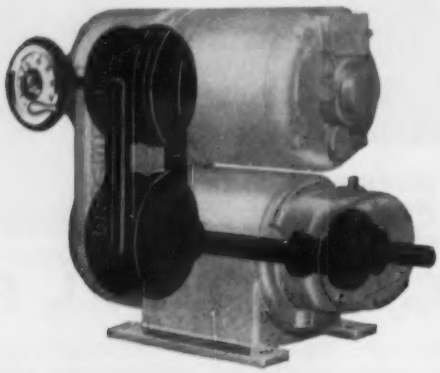
REEVES

the right speed for every need!

fractional HP Vari-Speed
MOTODRIVE

compact, attractive design

Within streamlined, metallic blue housing is REEVES' "weatherized" motor, time-tested speed changing mechanism, and heat-treated helical gear speed reducer. Maximum space for vertical model only 16⅝" x 21½" x 11½". Other models equally compact.



simple, accurate operation

14-turn handwheel on Speedial indicator gives you stepless, accurate speeds from 3 to 4660 rpm's—within a 2:1 to 10:1 speed range. Electric remote or automatic controls also available.

45° Model Horizontal Model

versatile application

Select your *exact* needs from 112 assemblies: ¼, ½ or ¾ hp. units; horizontal left or right, vertical, or 45° left or right models; horizontal or vertical down output shaft.

Write Dept. FE19d-M543 for complete bulletin.
REEVES PULLEY COMPANY • Columbus, Indiana
Division of RELIANCE Electric and Engineering Co.

sion technique, but using wheat data instead of semolina, the equation becomes:

$P_m = 0.807P_w + 0.01051_w - 0.383$

where P_m is predicted macaroni pigment in ppm.; P_w is wheat pigment in ppm.; and L_w is wheat lipoxidase activity $\mu.0_2$/min./g. This test should be useful to plant breeders and to millers.

In the case of semolina it is also possible to use a single reflectance measurement in place of the pigment determination, along with the lipoxidase measurement, to predict either purity of macaroni or macaroni pigment.—*Journal of the American Oil Chemists' Society*, 558-61, Nov. 1955.

Soluble Dry Milk

Dried whole milk in the form of granules or pellets is the product of a patented process that retains all fats and nonfats within the powder, and which reconstitutes into the equivalent of whole fresh milk.

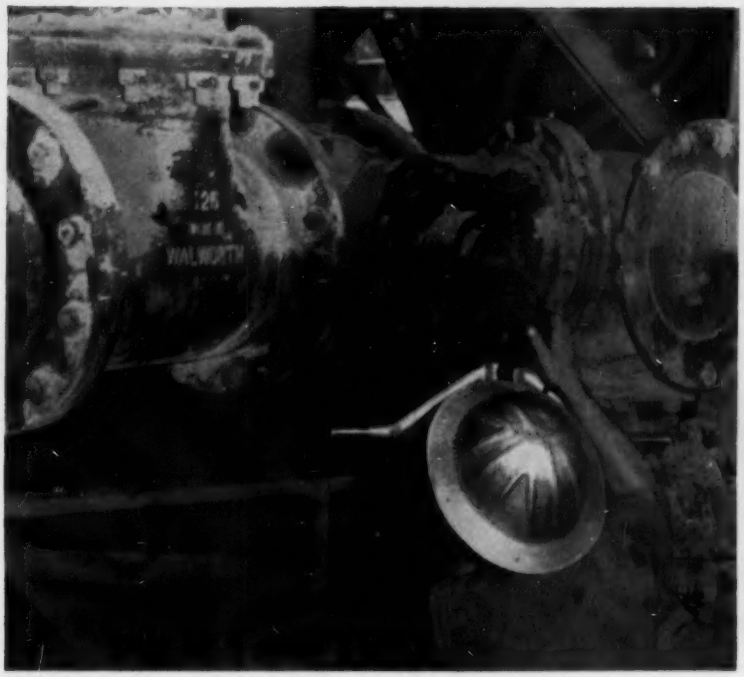
A novel feature of the process is that the original milk is first separated into cream of about 40% fat content and skim milk containing the nonfat solids. Five gal. of the cream is then mixed with 3 qt. of a solution prepared by boiling 1 lb. of rice in a gal. of water and continuing the boiling until the volume is reduced one-fourth.

Mixture of cream and viscous starch solution is allowed to stand at room temperature for 12 hr., after which it is mixed with a sufficient quantity of the skim milk to produce 16 gal. A small quantity of a tasteless and nontoxic phosphate may be added to promote thorough mixing of the ingredient.

Resulting homogeneous mixture is heated to 180 F. and sprayed under a pressure of 2,500 psi. into a heated chamber charged with N and CO_2. Dried product contains about 3% moisture. It is passed through an 80-mesh screen, spread on a conveyor and coated with a spray of milk sugar, tapioca starch, methyl cellulose, or a combination thereof, after which it is packed in moisture-proof, gas-tight containers in an inert gas. Product is said to keep for an indefinite period.—U.S. Patent 2,719,792, Oct. 4, 1955.

Determination of Calcium In Sugar Liquors

Two rapid methods for determining calcium in sugar solutions have been announced from South Africa. They are especially useful in analyzing colored solutions where titration with versenate is not feasible because the



CEMENT: Lubricating a Walworth Lubricated Plug Valve in a West Coast cement plant.

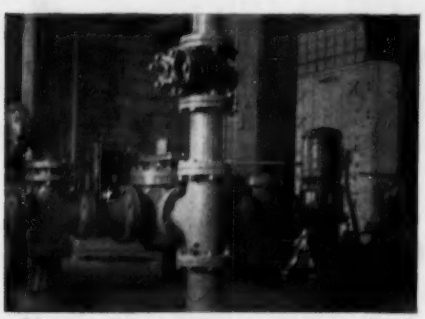
BEVERAGE: A battery of Walworth Bronze Lubricated Plug Valves installed in the blending department of a distillery.

PAINT: Eighteen Walworth Lubricated Plug Valves in a common manifold installation in the varnish division of a midwestern paint and varnish works.

serving almost any industry you can name . . .

WALWORTH LUBRICATED PLUG VALVES

FOOD: Walworth Lubricated Plug Valves are included in the piping arrangement in this large midwestern bakery.



PUBLIC UTILITY: Straight-way and three-way Walworth Lubricated Plug Valves installed in a modern West Coast sewage disposal plant.

At one time Walworth Lubricated Plug Valves were considered a "specialty item". Here are some of the features that have led to their employment in a wide range of industries as high quality 'all-purpose' valves:

(1) There are no threaded stems or complicated seating mechanisms. (2) Because the plug is always seated in the body, solid matter, which might be in the line contents, cannot wedge between the seating surfaces and prevent a tight closure. (3) The position of the wrench handle, or the marking on the plug shank, or the stop collar, clearly indicate the position of the plug. The operator can see from a considerable distance whether the valve is open or closed. (4) Quick opening and closing of the valve is assured by only a quarter turn of the plug. (5) Lubricant can be renewed while the valve is in service.

Walworth manufactures complete lines of Lubricated Plug Valves in a variety of types and materials for working pressures up to 5000 psi and for vacuum services. Sizes range from ⅛ to 30 inches.

See your Walworth Distributor or write to Walworth for complete information.

WALWORTH

valves . . . pipe fittings . . . pipe wrenches

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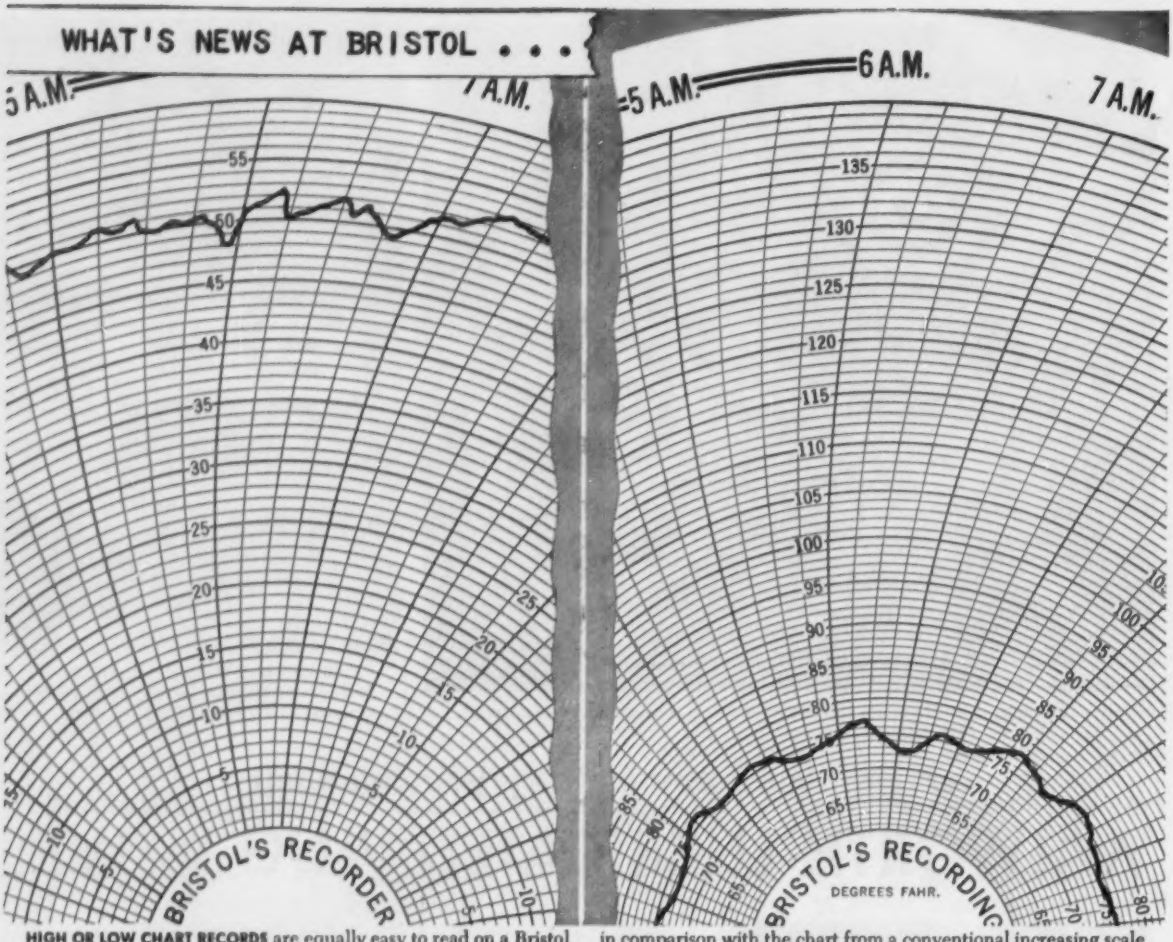


HIGH OR LOW CHART RECORDS are equally easy to read on a Bristol 2DL Recording Vapor-Pressure Actuated Thermometer . . . in comparison with the chart from a conventional increasing scale vapor-pressure recording thermometer shown above.

Bristol leads with linear scale vapor-pressure actuated recording thermometer

Tagged by instrument men as "the greatest advance in 25 years of recording thermometer building," Bristol's 2DL vapor-pressure actuated recording thermometer has a uniform linear scale that's equally easy to read at any point in its range.

It's another example of Bristol's "Human-Engineering" that means greater operating convenience, fewer errors, and easy visual interpolation.

MORE GOOD NEWS! In addition to this new high in readability throughout the entire measured range, Bristol has eliminated ambient temperature effects to boost the inherent accuracy of the recording thermometer still further.

GET ALL THE FACTS about these rugged precision instruments. Write today for free 48-page Bulletin T840 – it tells all about typical installations, ranges, charts, bulbs, and tubing. The Bristol Company, 115 Bristol Road, Waterbury 20, Conn.

5.20

HIGH-SPEED RESPONSE AND ACCURACY are key advantages of the new Bristol Vapor Pressure Recording Thermometers.

BRISTOL

IT'S MADE IN CONNECTICUT

POINTS THE WAY IN HUMAN-ENGINEERED INSTRUMENTATION

TRADE MARK BRISTOL'S REG. U.S. PAT. OFFICE

AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS

color change of the indicator is masked by the color of the solution being tested.

For molasses the dilute solution is run through a column of cation exchange resin which retains the calcium quantitatively. It is later recovered with dilute HCl and titrated in colorless solution.

For mixed juices, which cannot be analyzed by the ion exchange method, the solution is clarified with basic lead acetate. Na Cl is added and the mixture is filtered. The first few ml. of filtrate are discarded and an aliquot part of clear filtrate is used for the determination.

Five drops of dimercaptopropanol solution are added, and sufficient Na OH solution to dissolve the precipitate. Calcium is then titrated with versenate, ethylene-diamine-tetra-acetic acid, in the usual manner.

Traces of manganese in the juices may decolorize the murexide indicator, in which event hydroxylamine hydrochloride and more indicator should be added.—*South African Sugar Journal*, 543-545, Aug. 1955.

Alcohol Extraction Of Rice Bran Oil

Semipilot experiments on stabilization of rice bran and extraction of bran oil have shown that: (1) Fresh bran can be stabilized by heating to 100-105 C. for 1-2 hr., thus insuring its storage without increase of free fatty acids, and (2) ethyl alcohol is a good solvent for the oil, permitting recovery of 87-92% of the petrol-soluble lipids.

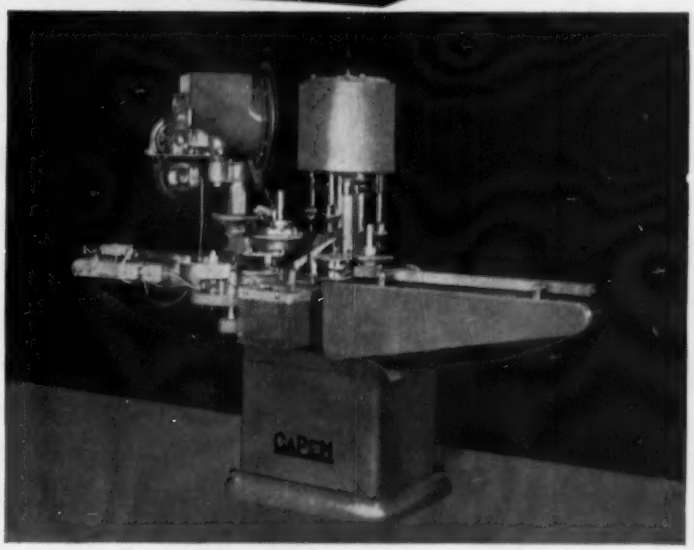
In the experimental work on stabilization, after 10 days' storage the untreated bran yielded 22.1% free fatty acids in extracted oil, whereas heated bran yielded only 4.1%. After reheating at this point the treated bran showed only 7.6% free fatty acids following 50 days' storage, while the untreated showed 40.6%.

Extraction experiments were made with ethyl and isopropyl alcohols, petrol, hexane, benzene, and chloroform. Alcohols yielded green oils, and hydrocarbon solvents gave brown oils. Ethyl alcohol was the preferred solvent.

Byproducts of refining were rice wax, fatty acids, B-vitamins in a rich sugar syrup, and extracted bran meal. Latter retained ¼-½ of B-vitamins thiamin, and riboflavin, as well as tocopherol in the original bran, and can serve as a good cattle feed.—*The Bulletin*, Central Food Technological Research Institute, Mysore, India, 205-08, Vol. IV, No. 9.

IF PACKAGING COSTS ARE SKYROCKETING

CAPEM SCREW CAPPERS WILL BRING THEM DOWN



More CaPeM Automatic Screw Cappers are in use than any other make. And for very good reasons. They combine low initial cost, low operating cost and a minimum of maintenance expense.

MEET EVERY PACKAGING REQUIREMENT

Eight standard CaPeM models accommodate a broad range of standard sizes and shapes of both containers and caps, as well as a wide variety of flexible molded closures of the CT type, both in combination with polyethylene squeeze bottles and otherwise.

In addition, advanced types of CaPeM machines are adapted for sorting, feeding and applying Wheaton and similar type closures, Kimble-type polyethylene plugs, polyethylene fitments, corks, etc., and in combination with a wide variety of secondary closures.

CaPeM is fully automatic . . . delivers a uniformly dependable seal . . . handles bottles, cans, jars and jugs from 2 ozs. to gallons . . . applies all types of metal and plastic screw caps . . . is easily synchronized with all standard types of related equipment.

Write for specifications and the name of your nearest Consolidated representative. You'll find his broad experience with all types of packaging problems helpful.

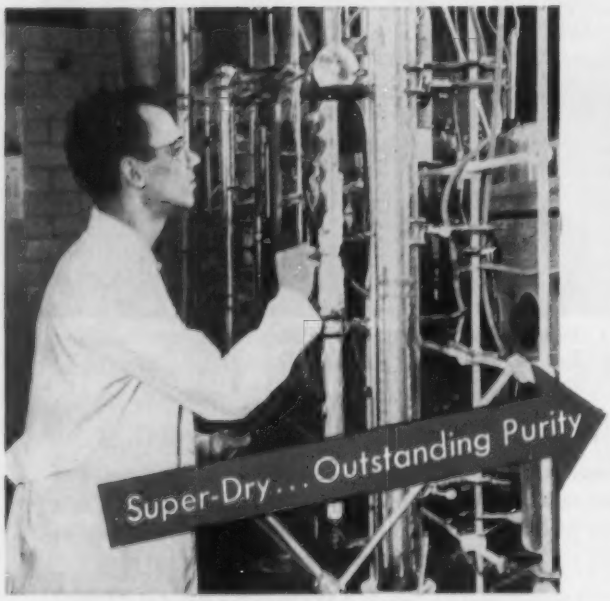
CONSOLIDATED PACKAGING MACHINERY CORP.

1400 West Ave., Buffalo 13, N. Y.

APPR

Leading Refrigeration and Air

genetron®



Look at the stringent manufacturing specifications listed here for the principal "Genetrons." Note their exceptionally low moisture content. For example, "Genetron" 12 and "Genetron" 141 are so dry they contain less than ten parts of water per million parts of refrigerant. That's moisture equal to only one thousandth of one percent (0.001%).

The overall purity of "Genetrons" is equally good. See how low they are in non-condensable gases and low boiling impurities. And, remember the quality of current production consistently surpasses even these specifications. No wonder so many leading manufacturers now prefer "Genetrons" as original charge for their equipment!

genetron 12—WHITE LABEL

DICHLORODIFLUOROMETHANE

Quality Specifications

Moisture wt. %, max.	0.0010
Chlorides	none
High boiling impurities—vol. %, max.	0.05
Non-condensable gases (gases insoluble in perchloroethylene)—vol. % in vapor phase, max.	1.5
Boiling pt. at 760 mm. Hg °F.	−21.6
Boiling range °F (to 85% pt.), max.	0.9

genetron 141—GREEN LABEL

MONOCHLORODIFLUOROMETHANE

Quality Specifications

Moisture wt. %, max.	0.0010
Chlorides	none
High boiling impurities—vol. %, max.	0.05
Non-condensable gases (gases insoluble in perchloroethylene)—vol. % in vapor phase, max.	1.5
Boiling pt. at 760 mm. Hg. °F	−41.4
Boiling range °F (to 85% pt.), max.	0.9

genetron 11—ORANGE LABEL

TRICHLOROMONOFLUOROMETHANE

Quality Specifications

Moisture wt. %, max.	0.0015
Chlorides	none
High boiling impurities—vol. %, max.	0.05
Boiling pt. at 760 mm. Hg. °F	74.7
Boiling range °F (to 85% pt.), max.	0.5

OVED!

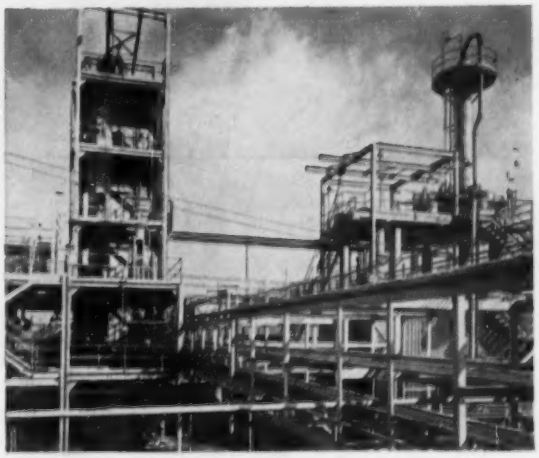
Conditioning Manufacturers All Approve...

Super-Dry Refrigerants

Few products have ever undergone such exhaustive examination as "Genetron" Refrigerants. Leading refrigeration and air conditioning manufacturers have checked and rechecked them intensively . . . proved for themselves that "Genetrons" meet or surpass their most exacting specifications for fluorinated hydrocarbon refrigerants.

Yes . . . in every case . . . "Genetrons" have been certified for the original or replacement charge in America's finest equipment. That's because they have been proved to be—

- **Super-Dry—guaranteed exceptionally low moisture content.**
- **Non-toxic, non-flammable, stable, safe.**
- **Non-corrosive to standard equipment materials.**
- **Critical and freezing points well outside range of operating uses.**
- **Solvent action on oil helps prevent solidification or congealing of lubricant.**
- **Miscible with oil; aid in lubrication of equipment.**
- **Identical and interchangeable in all respects with comparable fluorinated hydrocarbon refrigerants produced by any other manufacturer meeting the same high standards.**



EXTENSIVE FACILITIES:
In addition to its expanded "Genetron" production center at Baton Rouge, La., General Chemical has large new "Genetron" facilities at Danville, Ill.

AVAILABLE EVERYWHERE!
Coast-to-coast, America's leading Refrigeration and Air Conditioning Wholesalers feature *"Genetron" Super-Dry Refrigerants.* There's one as near to you as your telephone ready to supply you with complete stocks of *"Genetrons"* and with up-to-the-minute data on their uses.

Basic Chemicals for American Industry

GC Allied Chemical

GENERAL CHEMICAL DIVISION
ALLIED CHEMICAL & DYE CORPORATION
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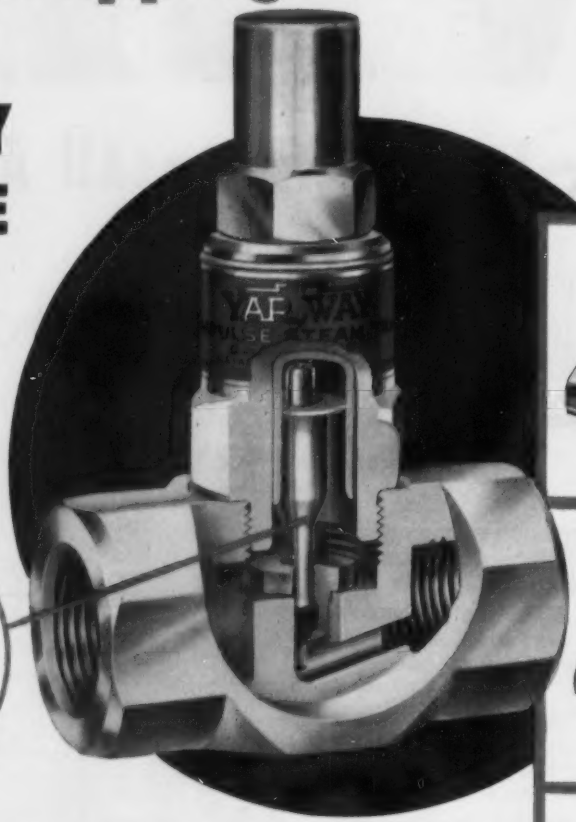
See your refrigeration wholesaler

the impulse that revolutionized steam trapping

YARWAY IMPULSE STEAM TRAP



the only moving part

...a small stainless steel valve that literally floats on the condensate load. Gets equipment *hot in a hurry—and keeps it hot!*

Twenty years ago YARWAY applied a unique theory of thermodynamics to steam traps—and gave industry the amazing YARWAY Impulse Steam Trap.

Today—over a million YARWAY Impulse Steam Traps later—advantages like the following continue to convert new users, and convince old users to standardize on the YARWAY Impulse:

- QUICK HEAT-UP AND EVEN TEMPERATURES OF EQUIPMENT
- GOOD FOR ALL PRESSURES WITHOUT CHANGE OF VALVE OR SEAT
- SMALL SIZE—LIGHT WEIGHT
- ONLY ONE MOVING PART
- STAINLESS STEEL—minimum maintenance
- WON'T FREEZE UP
- A COMPLETE LINE of sizes and types for every requirement
- IMMEDIATELY AVAILABLE from 270 local Industrial Distributors

For free Trap Selector, or 24 page Bulletin, write

YARNALL-WARING COMPANY
127 Mermaid Avenue, Philadelphia 18, Pa.

SERIES 60 and 120

For all *normal* trap requirements, pressures to 400 and 600 psi.

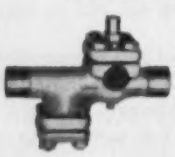
½" No. 20-A

For *light loads* on tracer lines, steam mains, small presses, etc.

SERIES 40

For *heavy loads* requiring extra high capacity steam traps.

INTEGRAL-STRAINER HIGH PRESSURE TRAP



For *high pressures, high temperatures.* (Flanged or welding connections.)

YARWAY **IMPULSE® STEAM TRAP**

OVER 1,000,000 YARWAY IMPULSE STEAM TRAPS USED

Making "Gourmet' Cakes

—Continued from page 57

on trays that are loaded onto portable racks. Transferred into a cooler, cakes are allowed to set before covers are machine-applied to the foil pans.

For the manufacture of all-butter pound cake (12 oz.), a continuous line has been engineered. Batter is prepared in beater-type mixers, from which it is fed into a stainless steel holding tank by a double-action piston pump.

Smooth-texture batter is assured as it is fed into a continuous Oakes mixer. From this mixer, homogenously blended batter is directly piped into a volumetric cake depositor. This piston unit deposits batter in three rectangular foil pans with each stroke.

Cakes are then baked in a revolving tray-type oven, cooled, and covers are applied to the foil pans.

End (*Resume reading on page 58*)

Engineering Ingenuity

—Continued from page 75

Front wheel is swiveled to permit turning in a small area.

To use, an operator moves a dolly up to a filled drum, reaches forward, tilts the drum away from him and pushes the dolly under it. (The low clearance makes this an easy operation.) He then pulls the drum forward on the dolly and moves it easily to the mechanical dumper.

6—Broccoli Distributor

At the company's Exmore, Va., freezing plant a problem was faced in distribution of washed broccoli, between several inspection tables. Installation of specially designed drums that remove desired quantities from feed belt at each line solved it.

Rubber strips were fastened to the outer surfaces of flat steel pulleys, which are motor-driven at slow speed. These pulleys were mounted vertically above the feed belt, at the points where it was desired to transfer product to inspection belts (see photo).

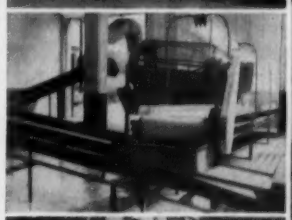
Pulley mountings are movable, and each is set further back on the belt. The one in the foreground in the photo is set near the front of the belt enabling a part of the product to pass in back of it. When properly adjusted, each will remove the desired quantity automatically.

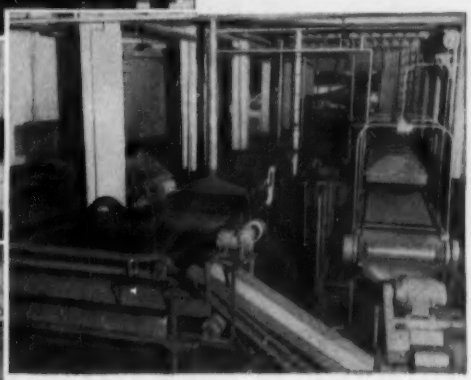
In addition to freezing products in consumer size packages, large quantities of lima beans, peas, cut carrots,

ENGINEERED by *Robins*

to minimize lost motion in processing of greens

11 Robins units, installed in accordance with Robins advice, make completely automatic operation a reality.





THIS GREENS PROCESSING LINE UTILIZES:

SANDERS
FOOD WASHERS
AGITATING WASHERS
STEAM BLANCHER
COOLER
ELEVATORS
INSPECTION CONVEYORS
DICING MACHINE
WEIGHING CONVEYORS
PACKAGING CONVEYORS

This Robins-engineered installation is an example of results achieved where Robins engineers are called in to help solve a problem . . . of equipment . . . of layout . . . of costs . . . of quality control . . . all factors that have a bearing on profitable operation.

For over 100 years, Robins equipment, know-how and ingenuity have played a part in the successful operation of many of the country's best-known food processing plants.

Put your problem up to Robins. It it can't be overcome with standard equipment . . . Robins will design, build and install specially designed equipment for the job.

Know the Robins engineer in your area . . . keep a Robins catalog on hand. For problems that demand top priority—call or write direct.

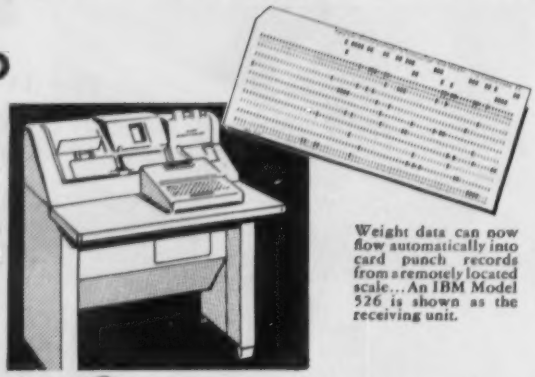
A.K.Robins AND COMPANY, INC.

Manufacturers of Food Processing Machinery Since 1855

713-729 East Lombard Street • Baltimore 2, Md.

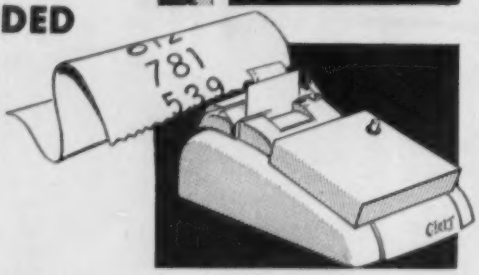
New REMOTE WEIGHT RECORDS

TABULATED



Weight data can now flow automatically into card punch records from a remotely located scale... An IBM Model 526 is shown as the receiving unit.

ADDED



Weight records can be transmitted to an adding machine and printed on the tape and inserted tickets with ability to totalize weight on the tape. Clary Model 1972 shown.

DIGITAL INDICATION

A completely new concept of weight indication! From a remotely located scale, illuminated digital weight-indication is obtained.

by **TOLEDO ELECTRONIC WEIGHT CONTROL**

The weight indication passes through a Toledo digital scanner and electronic counter and translator to provide an accurate signal that operates these remote devices to bring weights anywhere in the form most useful to you.

Through Toledo's new electronics system of remote data handling, weight data is no longer limited as to form, or close proximity to the point of origin. Weights can now go anywhere . . . and appear in tabulated, added, recorded, or digital-indicated form. This greatly extends the capabilities of TOLEDO-mation throughout production, and assures maximum cost control accuracy.

What is your weight control problem? Write for bulletins on new Toledo remote digital-indication and recording.

Toledo Scale Co., Toledo 1, Ohio.

TOLEDO® *Headquarters for* **SCALES**

etc., are frozen in bulk and stored for later packaging.

7—Proportioning Device

Two problems were faced in this operation: (1) Obtaining a uniform mixture when packing combinations such as carrots and peas, or mixed vegetables, and (2) separation of pieces that had frozen together.

These problems were both solved by the shop-built unit shown. Six tapered hoppers, each holding approximately 100 lb. of frozen vegetables, were constructed. Then six sections of 4-in. pipe were fitted with worms having sprockets outside the bearings on one end. Openings were cut in the pipes that were equal in size to the bottoms of the hoppers and, in the other end, smaller holes were cut on the opposite sides.

Pipes were welded to bottoms of individual hoppers, and hoppers were assembled side-by-side into a unit which was mounted on a pipe stand. A screw conveyor was attached to the other ends of the 4-in. pipe, directly below the smaller openings.

An electric motor with speed reducer was mounted at one end to provide power, through chains, for operation of the six screws. Speed of each screw is governed by size of sprocket on its drive shaft.

A small ice crusher, equipped with rollers that run on rims of the hoppers, permits separation of frozen vegetables and their discharge into any hopper.

With this unit it is now possible to supply the packaging line with any desired mixture of frozen vegetables. *End* *(Resume reading on page 76)*

Continuous Box Dumper

—Continued from page 61

feed chain-track tilt over large rollers to clear these tracks. Discharge roller conveyor holds five boxes.

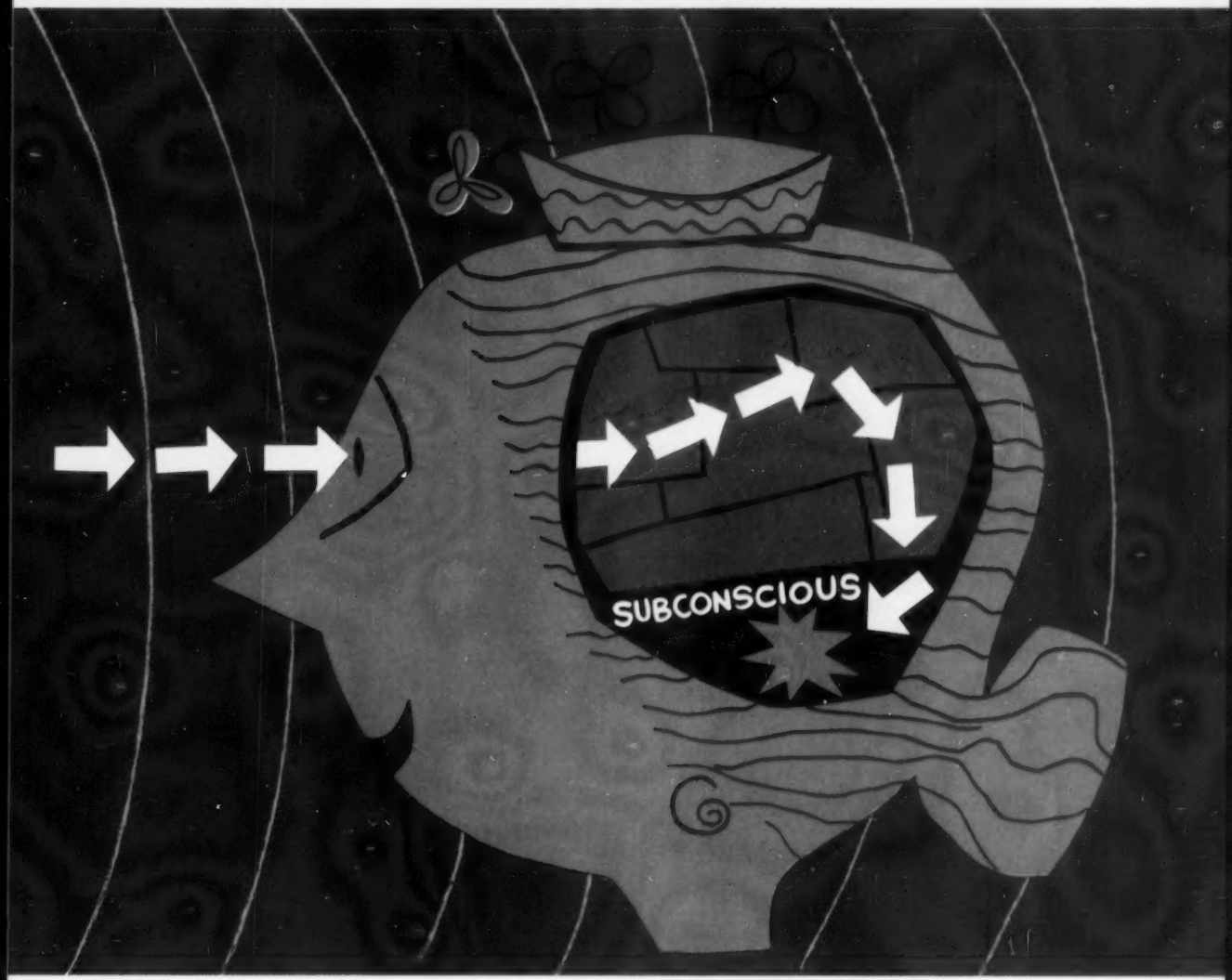
The dumper track moves more rapidly than the feed-in, quickly positioning a loaded box, then stopping movement of the feed-in track by limit switch.

Following the dumping cycle, empty box is again tilted over rollers onto the faster moving discharge track. Then the cycle is repeated. The U-shaped conveyor system is designed to place both feed-in and discharge points within easy reach of the lift-truck operator.

Boxes are firmly held in the carriage by cam-actuated clamp arms. These tighten as the dumper rotates. Dumper is powered by a 3 hp. motor and tracks by a ¾ hp. one.

End *(Resume reading on page 62)*

Impulse buying is psychological!



• • • and to create impulse sales, your frozen food wrapper must appeal instantly and favorably to a shopper's emotions—to her *subconscious* mind. Intensive market research proves that three basic elements of modern package design—when properly compounded—stimulate the shopper's imagination...clinch sales on the spot.

But modern package design is a science. To achieve a frozen food wrapper that *sells on impulse* against all competition requires highly specialized knowledge and experience. Take advantage of this sales-proved package design service that Western Waxed Paper Division offers your frozen foods.

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... by Design!

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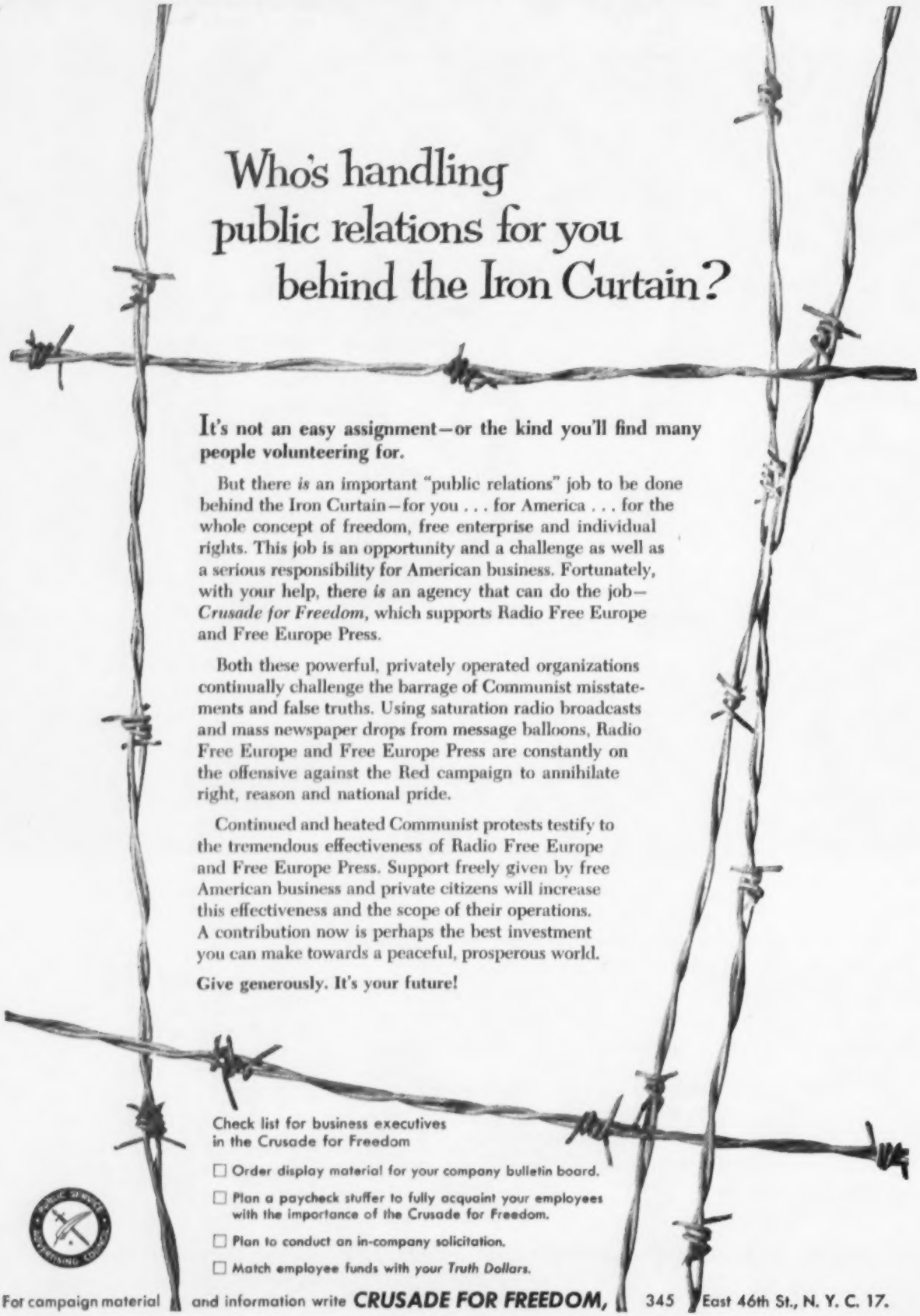

Who's handling public relations for you behind the Iron Curtain?

It's not an easy assignment—or the kind you'll find many people volunteering for.

But there *is* an important "public relations" job to be done behind the Iron Curtain—for you . . . for America . . . for the whole concept of freedom, free enterprise and individual rights. This job is an opportunity and a challenge as well as a serious responsibility for American business. Fortunately, with your help, there *is* an agency that can do the job—*Crusade for Freedom*, which supports Radio Free Europe and Free Europe Press.

Both these powerful, privately operated organizations continually challenge the barrage of Communist misstatements and false truths. Using saturation radio broadcasts and mass newspaper drops from message balloons, Radio Free Europe and Free Europe Press are constantly on the offensive against the Red campaign to annihilate right, reason and national pride.

Continued and heated Communist protests testify to the tremendous effectiveness of Radio Free Europe and Free Europe Press. Support freely given by free American business and private citizens will increase this effectiveness and the scope of their operations. A contribution now is perhaps the best investment you can make towards a peaceful, prosperous world.

Give generously. It's your future!

Check list for business executives in the Crusade for Freedom

- ☐ Order display material for your company bulletin board.
- ☐ Plan a paycheck stuffer to fully acquaint your employees with the importance of the Crusade for Freedom.
- ☐ Plan to conduct an in-company solicitation.
- ☐ Match employee funds with *your Truth Dollars.*

For campaign material and information write **CRUSADE FOR FREEDOM,** 345 East 46th St., N. Y. C. 17.

Questions & Answers

THIS MONTH'S PROBLEM

Bean Baking Query

Question—We have been considering the oven-baking of beans prior to canning. At present, we believe that a certain amount of water or sauce might have to be added during baking to replace moisture losses. Just how to do this without removing the pots from the oven is our immediate problem. Have you any suggestions?

DECEMBER PROBLEM

Bulk-Handling of Mayonnaise

The Question Was—At present, we are canning edible oils, which are shipped in tank cars from the refinery. We are wondering if we can do the same thing with mayonnaise—receive tank car shipments, pump it from cars into our own tanks, and then fill it into jars? And can you furnish us with the pros and cons of this method of bulk-handling mayonnaise?

Answer—We have never heard of anyone attempting to bulk-ship mayonnaise in tank cars. Certain important problems would have to be explored.

For example, what are the chances of the emulsion breaking down during shipment of such a large amount of mayonnaise? You probably are familiar with the frequent emulsion breakdowns which occur in mayonnaise packed in the largest type container being used—1-gal jars.

Too, while, positive-displacement-type pumps can handle the mayonnaise from tank cars, there still is the cleaning problem. And with cleaning so difficult, rancidity can very readily develop in those inaccessible or difficult-to-get-at spots in the car.

As a starter, why don't you look into the possibility of bulk-shipping mayonnaise in 55-gal drums? Mayonnaise can readily be handled from these drums by an air-operated pump (FE Sept. '52, p. 83).

More About Problem

There is little, if anything, to recommend re-packaging of mayonnaise from tank cars. While it is evident that a company dealing in edible oils would be interested in mayonnaise (80% of which consists of edible vegetable oil), there are too many serious drawbacks.

They are:

1. Only glass-lined or stainless-steel tanks could be used for storage, since corrosive vinegar is one of the components of mayonnaise. Most tank cars are of iron, and iron contamination would be detrimental.

2. Mayonnaise begins to "set up" almost immediately after manufacture. It must not be moved during the first 24 hr. or the "set" will be impaired. After the first 24 hr., disturbing the product (as pumping from a tank car) would be even more harmful. At best, it is a delicate emulsion that must be carefully handled.

3. It cannot be exposed to a wide range of temperatures, since it is rather unstable. Cold weather brings about freezing, while excessive heat causes oil separation and rancidity. There is also an increase in bacterial load in hot weather. Since specifications deny the use of antioxidants or preservatives, you are at the mercy of the elements, with the constant threat of spoilage. Controlling the temperature of the tank cars would be very costly.

4. Added to the cost of temperature control are the many stainless steel valves, pipes, and fittings carrying the mayonnaise from tank car to filling machine. This would make the total cost prohibitive.

5. Probably the most discouraging factor is the matter of daily sanitation. Every tank, pipe, connection, and piece of equipment in contact with mayonnaise would have to be taken apart, brushed, cleaned with detergents, and then chlorinated. This would be most time-consuming and inefficient. And all that could be derived from such a method would be an inferior product—of poor consistency and texture, and of shortened shelf-life due to excessive handling.

Considering your aims (which must be to pack the best possible mayonnaise while realizing economies inherent in your business), the best procedure you can follow is that already used by many oil packers. You should evaluate the volume of mayonnaise business you can obtain, and purchase a modern, continuous mayonnaise manufacturing set-up to handle that business.

Since you already have oil storage tanks and pumps, purchase only mixers, a colloid mill, and a filling unit. Depending on your requirements, you may purchase equipment to handle as little as 50 gal. per hr. up to 1,000 gal. per hr.—*Alfred J. Finberg, Consultant in Food Technology, Brooklyn 1, N. Y.*

Code-Date Inquiry

Question—We code-date our products for quality-control by imprinting a series of characters on each label ahead of time. Employed is a small machine that is vitrually a printing press. However, we try to keep this mark as inconspicuous as possible to avoid detracting from the appearance of the product when it gets onto store shelves.

Lately, we have thought of putting batch and shift numbers, as well as the date, on the code marks. But we are limited in the number of characters that can be applied. Can you suggest some simple way of marking our products with this additional information, without cluttering up the labels?

Answer—Perhaps you could adopt edge-coding of your labels, either in place of, or in addition to your present imprinting method. A special machine (developed abroad) is now available in this country and would perform the identification task you mention.

This little unit, driven by a fractional-horsepower motor, occupies less than 2 sq. ft. of space. Thus, it may be located right at the label line. Probably it can be operated by regular personnel at no added labor cost, since it marks up to about 2,000 labels a minute. It cuts tiny notches in the edge of labels in packs of several hundred at a time, and handles oval or round labels as well as straight-edged ones.

The number and spacing of the

How Would You Do It?

Readers are invited to submit to FOOD ENGINEERING answers to question, "This Month's Problem." Selected answers will be published with credit (unless you specify otherwise.) We pay space rates.

What is *Your* Problem?

Subscribers also are invited to send in food engineering questions. We undertake to provide answers, free, to the best of our ability. We do not undertake costly investigations. Give full information and your name. Your identity will not be disclosed.

Write to Questions & Answers Editor, FOOD ENGINEERING, 330 W. 42nd St., New York 36, N. Y.

Q.—Do you have any information on a new plastic film that resists penetration of insects?

A.—We understand a lamination of Mylar and Saran films will resist penetration by all boring-type insects.

Exposes foreign matter and residue! Resists oils, acids, alkalies!

Globe White Neoprene Rubber Belting installed on leading make conveyor.

EXPOSED: Dust, dirt and other accumulations! Product particles that are left behind!

The snowy whiteness of Globe White Neoprene Belting exposes them all to certain detection, enabling immediate elimination with hot water or live steam. *That's sanitation-plus!*

Known as the do-all conveyor belting of the food industry, for which it was specifically developed, Globe White Neoprene Rubber Belting consists of multiple layers of hard-woven, light duck, molded together with highest grade neoprene rubber between the plies and over the entire surface . . . finished with a 3/64" thick, satin-smooth cover on the carrying side and with a friction surface on the pulley side.

The characteristics of this type of construction are unmatched: Exceptional flexibility; high tensile strength; minimum stretch . . . all extremely advantageous in operations where head and tail pulleys are small, and on machines with limited take-up facilities.

Resistant to oil, grease, acids, alkalies — possessing a satiny smoothness that makes no impression whatsoever on the product conveyed, Globe White Neoprene Rubber Belting is today on the "must" list of numerous food processing and handling concerns.

Also available in Black. Ask about Globe White Ruff Top Neoprene Incline Belting, Globe Brown Neoprene Belting, with friction surface on both sides, and Globe Brown Kling-Top Neoprene Belting, with non-slip top for incline and decline.

Write Dept. E for free samples, literature and the name of your local distributor.

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KNOWN FOR QUALITY THE WORLD OVER

notches is quickly set by keys. Notches are read by code cards, and it is possible to mark a label with a large amount of data. Only a few notches need actually be cut—their location conveys the information.

Markings can be read only by persons having code cards, thus information can be kept as confidential as desired. In this way, you can imprint the information mentioned in your question, and also easily show—special test batches or formulas, reconditioned items, production line used, date to be withdrawn from sale, items produced by contract packers, etc.

Advantages for quality control purposes are obvious.

Manufacturing Halvah

Question—Have you specific directions for making "old fashioned" Asiatic Halvah candy?

Answer—Charge into a double-action, agitator-type, steam-jacketed kettle 1 qt. of water, 25 lb. of sugar, and 5 lb. of corn syrup. Cook to 268-270 deg. F., and then introduce 3 lb. of Cobee 92 coconut fat (E. F. Drew & Co., Boonton, N. J.).

Cut off steam, and add 30 lb. of sesame seed and 2 oz. of salt. Pour batch onto cooling slab. Level to desired thickness and cut to size.—*Justin J. Alikonis, The Al-Chem Laboratory, Inc., Bloomington, Ill.*

Role of Ascorbic Acid in Meat

Question—Will you explain how ascorbic acid intensifies red color in cured meat products?

Answer—The stable red coloring in cured meats results from the conversion of sodium nitrite (a cure ingredient) to nitric oxide, which then combines with the meat's myoglobin to form nitroso-myoglobin (the red color).

But the red color does not become intense if these reactions are slow and incomplete. Reason is that the meat's reducing agents slowly and only partially convert the nitrite to its oxide.

However, adding ascorbic acid or sodium ascorbate accelerates development of the red cure-color, which is then intensified. Here's how:

First, the acid or its salt converts met-myoglobin back to myoglobin, which is in a most reactive form to change into nitroso-myoglobin. Then they rapidly and completely reduce sodium nitrite into nitric oxide. Finally, with the curing step completed, residual ascorbic acid or its salt acts as an antioxidant and retards loss of color.

Backing this up are tests carried

out by the American Meat Institute Foundation. Addition of ¾ oz. of ascorbic acid per 100 lb. of meat to bologna emulsion prior to smoking extended shelf-life 37% over the control. Similarly, adding ⅝ oz. of sodium ascorbate per 100 lb. of meat resulted in a 55% extension in shelf-life.

Tests were carried out at 34 and 40 F., with 100 foot-candles of fluorescent light illumination.

Going Over to "LP" Gas

Question—Our chief maintenance mechanic wants us to try LP (liquid petroleum) gas in one of our fork trucks. We are a little hesitant because of possible accident hazard. Can you advise whether LP is practical for such use in food plants.

Answer—We understand that the use of bottled liquified gas for industrial trucks is increasing. And we see no reason why you could not use it in a food plant under proper conditions.

Quite likely, the reason your maintenance chief is promoting this fuel is that it burns so cleanly and completely. Reduced engine repairs and maintenance have been reported by users.

Another advantage is the virtual absence of obnoxious fumes. This is especially desirable for indoor operation, or for use around foods which might be particularly susceptible to odor pick-up.

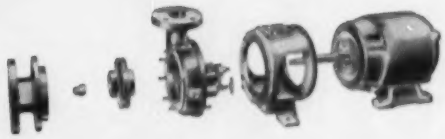
Truck manufacturers in most cases now furnish conversion kits with which a gasoline truck can be economically converted to LP. Probably the best way to evaluate this fuel would be to convert one truck, keeping careful record of its operation hours, fuel, oil, and maintenance costs. Comparing this record with costs for your regular trucks will give an indication of whether complete conversion would be worthwhile.

It would be well to consult your local fire authorities and insurance carrier to make sure that proper safety precautions are observed. LP gas is heavier than air and difficult to detect, thus leakage might accumulate in dangerous amounts in low spots such as basements or elevator pits. Outside storage is general practice, as is limi-

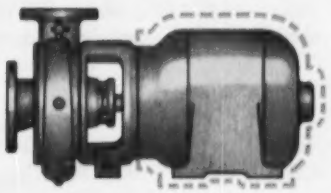
Q.—What is the best way to prepare chicken salad for packing in rigid, transparent plastic containers? Item is for refrigerated sale in retail stores.

A.—Blend 1 part each of diced celery and salad dressing with 3 parts of diced, cooked chicken meat. Salt and pepper to suit.

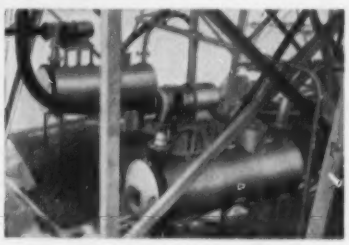
Q.E.D...which was to be demonstrated



uality of Ingersoll-Rand Motorpumps is evidenced in the extra-heavy, extra compact design and construction shown above. From suction to discharge a Motorpump is built to the highest standards that can be established.



fficiency is shown by smaller motor hp required to drive the I-R Motorpump. The impeller is precision balanced for peak performance. Design permits short shaft to eliminate deflection and whip. From packing to pump-casing, parts are engineered to make a smooth operating machine that delivers the goods—on every job.



urability is proved by the illustration above. These I-R Motorpumps were installed 4 years ago and paid for themselves in the first 90 days of service. Service is both rugged and continuous, yet, in all this time, there has been no maintenance downtime.

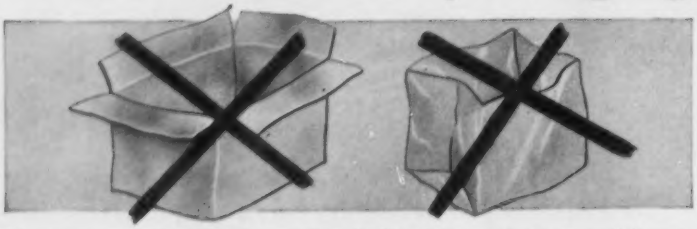
MOTORPUMP

Write:

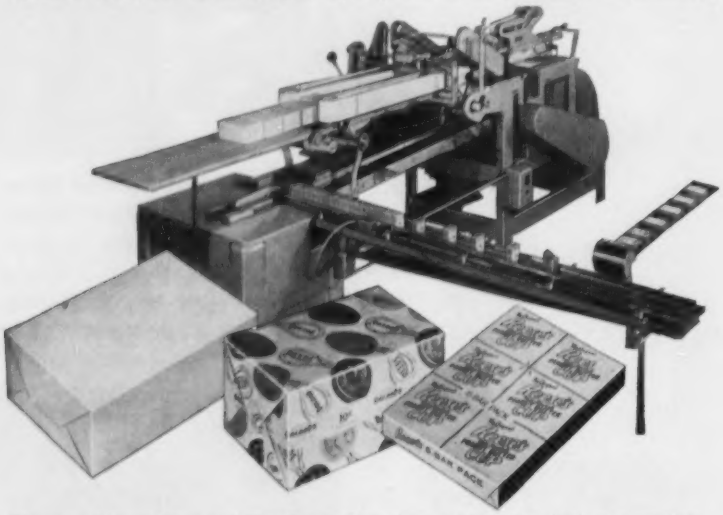
Ingersoll-Rand

9-220 ♥ 11 Broadway, New York 4, N. Y.

ACCUMULATOR and BUNDLER solves outmoded packaging



If you are still using expensive bulky heavy cartons and loose-fitting bags to gather your smaller packages into one larger unit, we can cut your costs with the new all-automatic Accumulator and Bundler. Eliminate carton and bag cost and inventory. Save on labor, hand filling and handling costs. Give your products a more secure modern container, tamper-proof factory sealed assurance.



Hayssen Accumulator and Bundler gathers from a single line feed any number of individual rectangular, tapered or cylindrical packages into a neatly stacked arrangement and automatically overwraps them with paper, film or foil, as you desire, into one tight, easily handled, protective bundle.

Manufacturers of the following products are today saving with Hayssen Automatic Accumulating and Bundling: Books, Matches, Butter, Bird Seed, Boxes of Screws, Nails, Tacks, Beans, Ice Cream, Candy, Confections, Cheese, Cough Drops, Cookies, Dessert Mix, Dried Fruits, Raisins, Cosmetics, Drug Items, Gelatin, Rice, Frozen Food Cartons, Soup Mix, Tea, Tapioca, Toothpaste, Toilet Tissue, Yeast and many others.

You, too, can cut costs with Hayssen Accumulating and Bundling. Open your ledger to Carton and Bag purchase, inventory and hand filling costs . . . then call Hayssen. We know we can save you time and money, and produce a better package for your distribution.

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tation on number of cylinders permitted on hand.

Changing of tanks must be adequately supervised. The ideal situation would be daily delivery, and pick-up of empties, as this would minimize hazards. We understand that such service is being extended to various areas and suggest that you look into it carefully.

Rail-Siding Maintenance

Question—Our company has recently purchased a plant to expand operations. But its rail siding (a facility not present in our original plant) causes maintenance problems with which we are not familiar.

Siding appears not to have had proper care—many ties are rotten and there is considerable rusting where brine apparently dripped from reefer cars. Have you any ideas on how we might go about rehabilitating it?

Answer—Railroad maintenance is a big subject, although a siding does not require the same attention as a main line bearing heavy, fast traffic. If the siding obviously needs *major* repairs, it would be well to seek a contractor specializing in this work, such as one belonging to the Association of Track Contractors.

On the other hand, careful inspection may reveal rails and switches that are not in bad shape. It may then be chiefly a matter of correcting the condition which caused rotting of ties, and replacing the deteriorated ties with sound ones.

Improper drainage is the main reason that ties rot, and it is usually brought about by improper ballasting. Inspect and mark ties needing replacement. Then, remove old ballast between ties, as well as that 24 in. out beyond tie ends. Next, take out defective ties and replace with new ones.

Q.—How can we make a filling for apricot bars—similar to the one in fig Newtons?

A.—Soak dried apricots overnight and run through "impact-in-air" comminutor or meat-type grinder. Blend ground apricots, 51.30%; sugar, 40.80%; and corn syrup, 7.90%. Then add sufficient water to bring to desired consistency.

For light traffic, ties 6 in. thick and 7 or 8 in. wide are satisfactory. Splitting and checking can be greatly retarded by driving S shaped irons into their ends. They should be carefully handled with tie tongs to avoid making holes which later can hasten decay.

New ballast should be filled in

around the replaced ties, and tamped. Small crushed stones (¾ to ¾ in.) are best for ballast, especially since cinders are becoming harder to get.

Remember, good ballast means good drainage and long tie life, for ties are the foundation of trackage. Therefore, it is important to do a good job of ballasting and replacing.

Good rail-spiking practice should be carried out as new ties are installed. Generally, spikes are staggered on the gage and field sides of the rails and, of course, they should be tightly driven.

We suggest you protect the metal where it is apt to corrode. Hot, high-asphaltic oil may be applied.

Cuts Doughnut Greasiness

Question—I overheard some bakers talking about a "jaw-breaking" named chemical that can be added to doughnuts to reduce grease absorption. Do you have information on it?

Answer—You may be referring to the chemical glucono-delta-lactone. When as little as 8 oz. of GDL are added to 100 lb. of flour, grease absorption is reportedly cut in half. GDL also serves as a leavening agent in those type doughnuts requiring a chemical leavener. We understand that you might have to experiment to find out exactly how much GDL would best suit your formula requirements.

Our readers might be interested in knowing that fat absorption can be greatly reduced when 4 oz. of GDL are used in making 1,000 waffle-type ice cream cones.

CIP Pipeline Query

Question—We are considering cleaned-in-place pipe lines to replace our dairy-type take-down lines for canning sauces. However, we are reluctant to discard our present expensive fittings, and are wondering if there is some way in which they can be used for a cleaned-in-place operation.

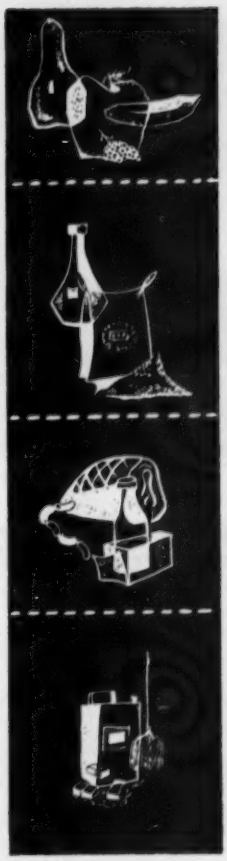
Answer—There is a way to use your existing fittings. They generally may be machined so that sanitary sealing rings can be fitted into them. A special motorized tool has been developed for this purpose and, though its initial cost seems high, it would soon pay for itself if you could salvage your existing fittings.

However, a word of caution. This operation is not as simple as you might expect. Care must be exercised in the machining, so that there are no crevices which might harbor dirt or

MORE THAN A QUARTER CENTURY EXPERIENCE in the corrosion field has enabled The Atlas Mineral Products Company to fill a long standing need in the food industry for an attractive durable floor . . . one that is corrosion proof and structurally sound.

a PRACTICAL FLOOR

for food processing operations



FURNANE ® FLOORS were developed in 1952 by Atlas. Atlas, leaders in corrosion engineering, combined two compatible resin cements in a patented* method of floor construction designed especially for the food industry.

FURNANE FLOORS exhibit the highly adhesive properties of Atlas developed polyester cements and the outstanding wearing properties of Atlas pioneered furan resin cement.

FURNANE FLOORS have gained wide acceptance throughout the industry — floors in dairies, bottling plants, breweries, meat packing houses and other food processing plants have stood up under conditions that caused deterioration and high maintenance costs of less durable floors.

Your plant will have an attractive, corrosion resistant, physically durable floor when you install FURNANE FLOORS.

*** Fully protected by U. S. Patent Nos. 2,690,411; 2,689,237; 2,669,522**

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MERTZTOWN, PENNSYLVANIA

Write for Bulletin 3-2

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J-80456

bacteria, and not be reached by the circulating cleaning solution.

It is understood that sealing rings must be made of material which is both non-toxic and of low moisture absorption.

It is generally a good practice to consult with your local health authorities when considering such a change-over. Remember, your pipe lines were not originally designed for such service, thus other changes may be needed.

Also, examine the pitch of the lines for proper drainage. A minimum pitch of 1 in. per 20 ft. is recommended. Pitch and drainage are particularly important, since any material pocketed during cleaning remains in the cleaned-in-place system.

Making Citrus Puree

Question—Do you have any information on a process for manufacturing a citrus puree, particularly orange, for noncarbonated beverages from the whole fruit—seeds, pulp, and skin?

Answer—In commercial use at the present time is an impact-in-air mill for size-reducing the entire citrus fruit. So finely comminuted are the skin, pulp, and seeds (if present) that they are not discernible to the eye. Too, the drink is readily dispensed through vending machines without clogging of the filling nozzle.

This fruit-handling process, we understand, results in a highly stabilized drink. Control of quality, however, by a skilled food technologist is essential. Reason is that the source of fruit, season of year in which harvested, and climatic conditions will result in products varying in acid, sugar, and moisture content. And the terpene fraction of the citrus oil must be carefully checked, otherwise an excessively high amount of terpenes results in a "paint-like" flavor.

Mushroom Soup Formula

Question—We grow and then pack mushrooms into 16-oz. cans. We'd also like to manufacture a creamed style mushroom soup. Do you have directions?

Answer—Run washed mushrooms through cutter, chopping to very fine size. Introduce 32½ lb. of chopped mushrooms into steam-jacketed kettle along with 16½ lb. of margarine. Brown in margarine, sprinkle into batch 4 lb. of flour, and then slowly mix in 32½ gal. of milk. Add 1½ lb. of salt and enough white pepper to suit, and continue cooking until batch thickens. Fill hot into No. 1 cans, seal, and sterilize 30 min. at 250 F.

Old Sage Notebook

—Continued from page 99

cross purposes. Therefore, these areas of conflict should be separated from the many non-conflicting interests between management and labor.—*Herbert O. Eby, Labor Relations Director, Pittsburgh Plate Glass Co., in talk before California Personnel Management Assn.*

Loyalty—Who's to Judge?

A company should avoid competing with the union for the loyalty of employees. The ironic part, here, is that employees often wonder what the furor is all about.

To the employee, the company and the union mean different things. The company affords him a job whereby he can take care of his personal and family obligations. He looks to the union, on the other hand, for social, educational, and economic reasons. And he feels that he can be loyal to both quite handily.

All too frequently, it is the company or the union (not the employee) who makes loyalty an issue.—*"The Management Review," AMA.*

Can't Take, Can't Give

The long-range interests of a union's members and therefore of the union itself, cannot be served by any course of conduct which places upon an employer conditions unsuited to his business or burdens his business cannot bear.

This is a fact of industrial life which must be realized in labor relations. And the sooner it is realized, the better it will be for all concerned. —*John L. McCaffrey in talk before the Industrial Relations Assn. of Chicago.*

Who Authorizes Contracts

The most common procedure called for under contract authorization provisions is to allow locals to negotiate with employers, but to require that the International approve the contract before it becomes valid and binding. Eighty-three union constitutions (covering 8 million workers) out of a total of 194 have such a provision.

In 13 unions (2 million members) the International has additional power. It can negotiate all collective bargaining contracts, or can step into local negotiations and make the contract whenever such action is deemed necessary.

Only 11 union constitutions

UNITED BB CORKBOARD (BLOCK BAKED) Patented

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BEND IT... United Corkboard is flexible. The big, straight-edged slabs fit snugly, take fewer joints. Corners and irregular construction are easy too.

SELF-SUPPORTING... United Corkboard provides structure, framing and insulation all in one . . . requires no internal supports . . . can even be used in self-supporting partitions.

LOW "K" FACTOR... United Corkboard properly installed retains its insulation value for the life of the installation . . . provides a time-tested material for low temperature service.

BONDS TIGHTLY... United Corkboard installs easily with hot or cold asphalt, or other common adhesives. Won't pack down. Resists dampness and formation of moisture carrying channels.

DEMAND UNITED CORKBOARD... for the finest in easy-handling, lightweight, superior-strength insulation. Insure an installation that goes up quickly and easily . . . without added fillers or binders. United Corkboard will not rot, swell, warp or support bacterial growth. It's fire-retardant, insect and vermin-proof.

FROM ENGINEERING DESIGN TO FINAL INSTALLATION

Our branch offices provide complete services. Trained engineers are available for consultation . . . or will design every detail of your job. Skilled work crews will erect your installation quickly and efficiently. Almost fifty years of service to the refrigeration industry is your assurance of satisfaction.

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UNITED CORK COMPANIES

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Manufacturers and erectors of cork insulation for almost a half century

Engineering and installation offices, or approved distributors, in key cities — coast to coast.

It's a question of
Taste...
with
VICTOR
BELTING
Your business is to capture the public taste. Ours *isn't*. Instead, we make sure that no taste—no undesired flavor from the belting itself is imparted to the foods produced. Proper belt construction makes cleaning easy, preventing any day-to-day carry-over of flavors from foods handled.
To *really* make sure, our research department keeps a careful, continual check not only on Victor belting construction, but also on actual performance under all operating conditions. That's why—with complete confidence—we recommend for your food handling:
VICTOR SUPRENE... special-woven cotton duck belting thoroughly impregnated with an exclusive neoprene compound. Waterproof, highly resistant to grease and most food chemicals, smooth-surfaced, and easily cleaned.
VICTOR 475...highest quality, solid-woven cotton belting impregnated and coated with a special neoprene compound. Developed for use where laboratory cleanliness is a *must*. Washable with hot water or steam, resists rancidity and deterioration.
For food handling the modern, sanitary way select from
Victor
Belting & Textile Belting Co.

(3.7%) permit local unions to make valid contracts without obtaining International approval.—*From a study made by National Industrial Conference Board, New York.*

"Woe Is Us—Here Comes Automation"

Quite a few years ago, containers in which foods were preserved were hand filled and hand soldered before sterilizing with heat.

Then came machines that filled cans at the then-high rate of 30-40 a minute, and also equipment that "automatically" closed them at this same "high velocity."

Today, both operations have been speeded to more than 1,000 cpm.

■ **This "Automation," as it's commonly called, already embodies a dread connotation—but it's really no more dangerous than its grizzled sire, "automatic."**

The dread comes mostly from union-created fear of unemployment due to machines replacing men.

Which they do.

It would have required a large crew, indeed—when cans were hand filled and soldered—to produce as many per day as two workers now turn out on our most modern can filling and closing combination.

And the difference in the quality of containers is just as great as the difference in speed of operation.

So we must admit that can filling and closing workers have been replaced by machines.

But the relative retail cost of canned foods is far below the relative price of the hand-made era, and also the income of those now employed in canning is relatively much higher.

In truth, manual packing could never have expanded employment of those whose living depends upon canning to where it is today.

The jobs created by the machines that are now filling and closing cans number in the hundreds of thousands, and the beneficiaries work not only in canning plants but also on farms, in machine shops, can-making plants, lumber camps, paper and carton making and printing plants, and in transportation, wholesaling, retailing, merchandising, etc.—*I.C.M.*

Smoother Communications

Management should work with—not around—the union in the field of employee communication.

Trying to out-race and out-maneuver the union in getting a message across to employees is ill-advised. Common sense suggests working out an agreement with the union on channels of communication so that those items which can quite properly be disseminated by the union are so handled.

Once the union understands this arrangement, the membership will like it and have no objection to the channeling of other general information via management communication.—*"The Management Review," AMA.*

Without Benefit of Fringe

The ant, a prodigy of strength,
  Lifts objects twice his weight and length
And never stops or sighs or glowers
  Because it's after working hours.
Though underground, he bears the onus
  And peril without thought of bonus,
And never once is heard to mention
  Retiring on a tax-free pension.
Nor does he frown or look askance
  At other, lighter-burdened ants.
Not one to bicker, blame, or sob,
  Not angling for a better job,
The ant has but one flaw I see,
  To wit, he doesn't work for me.
—*From "Light Armour," by Richard Armour, McGraw-Hill Book Co., N. Y. C.*

White Collar Union View

"Do not be afraid of white-collar unions. Sooner or later, companies will have to live with them, whether they like it or not.

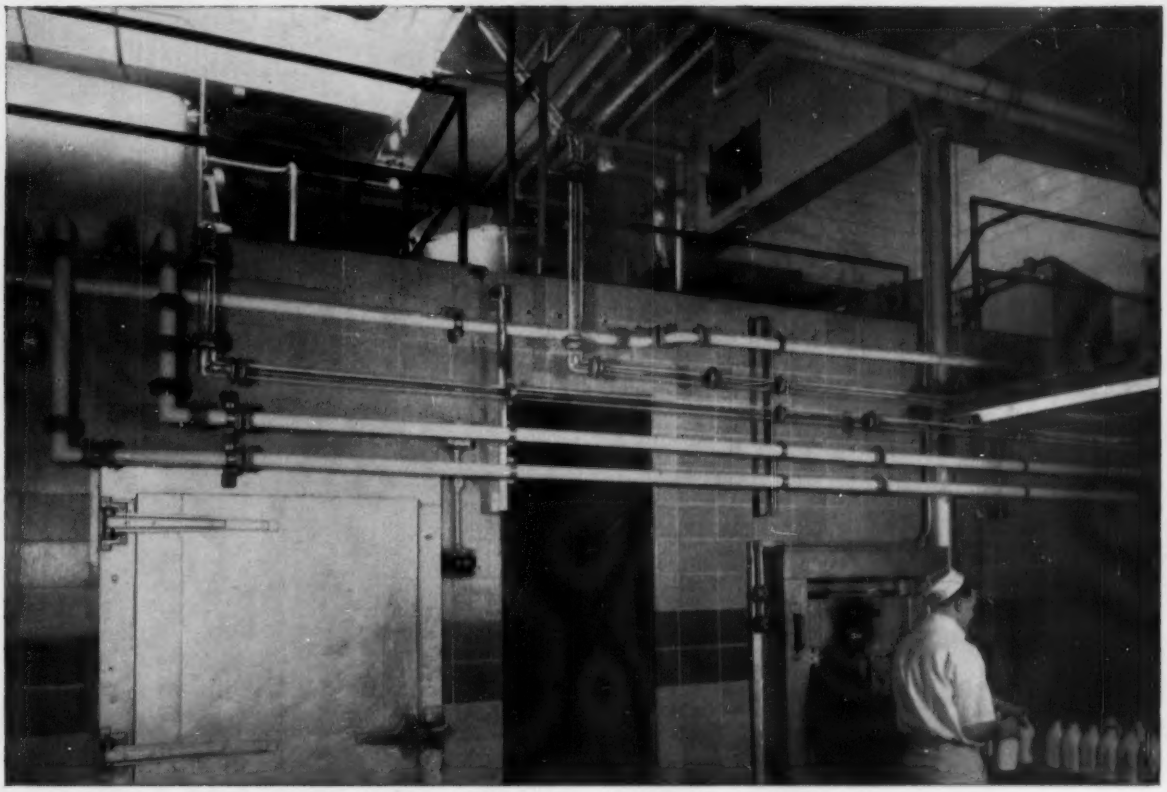
"At our company we tried an experiment during the past five years which many of our contemporaries predicted would prove disastrous: We actually urged our white-collar group to organize, and we have found that it greatly improved communications and performance. "Both our unions now force us to do a better management job."—*Saul M. Silverstein, President, Rogers Corp.*

One View of Bargaining

"Collective bargaining has come to mean two things: (1) a right to strike, (2) a prohibition against the employment of workers ready and willing to work at the wages the employer is able to pay.

"This means for all practical purposes that the business man has the choice of accepting the conditions put by the labor unions or going out of business because strikes can at times have deadly consequences for a firm."—*Philip Cortney, President, Coty, Inc., New York, before the California Personnel Management Assn.*

End (Resume reading on page 100)



Why General Ice Cream Corporation replaced milk lines in four plants with glass pipe

You can imagine the problems involved in piping milk.

Because it's such a perfect food, bacteria multiply threateningly if sanitation isn't strictly guarded. And milk solids cling tenaciously to any surface. When they cling, it takes time and money to remove them.

General Ice Cream Corp. spent a lot of time studying various methods of piping milk which would help them maintain the rigid sanitation standards for their Sealtest products.

They put a trial installation of PYREX brand glass pipe in their Schenectady, N. Y. plant, piped milk through it daily for two years.

The results of this trial were so satisfactory that they have already replaced other kinds of lines with glass in four of their plants. *Some of the lines replaced by glass pipe were nearly brand new!*

If you have a pipeline cleaning problem, why don't you give glass a trial? You'll find that even sticky foods, like syrup and noodles, present no cleaning problem for glass. You may be able to just flush the lines with near boiling water to get the cleanliness you must have.

If your piping problem is complicated by fruit acids or brine solutions, corrosionproof PYREX brand glass pipe gives you all the more for the modest amount it costs you.

If you worry about contamination, glass guards the flavor for you, can't possibly alter taste.

Don't put up with difficult cleaning or doubtful cleaning results. Stop corrosion and protect purity with glass pipe as many food processors now do. Write us and we'll give you the names of some near you, along with more information.

CORNING GLASS WORKS

Corning means research in Glass

CORNING GLASS WORKS, 52 Crystal Street, Corning, New York
Please send me Bulletin EA-1: "PYREX brand Glass Pipe in the Process Industries."

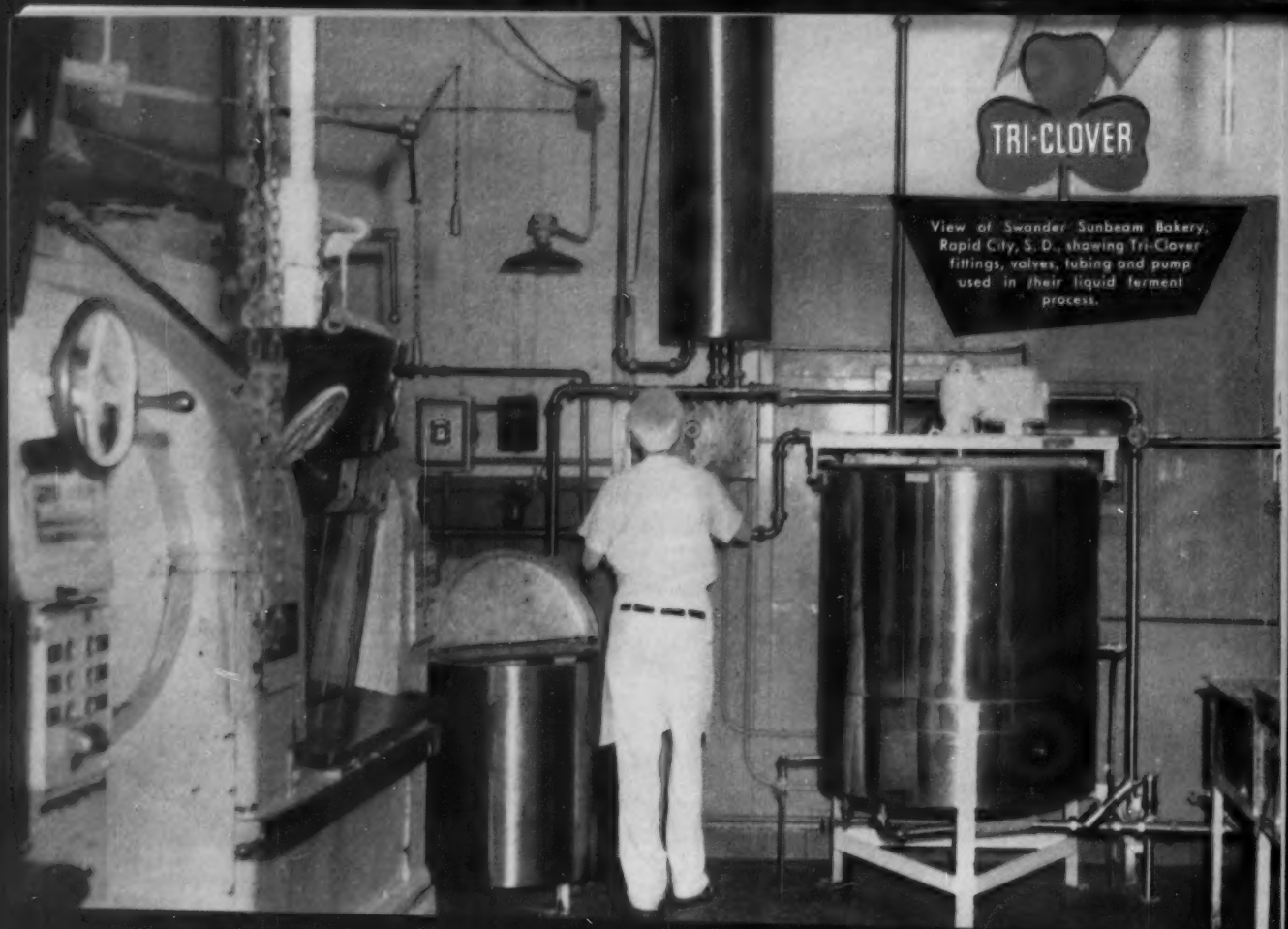
Name ..... Title .....

Company .....

Address .....

City ..... Zone ..... State .....

For more data, circle this page number on card at back →

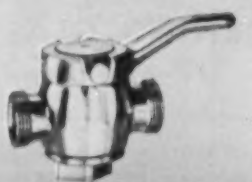


View of Swander Sunbeam Bakery, Rapid City, S. D., showing Tri-Clover fittings, valves, tubing and pump used in their liquid ferment process.

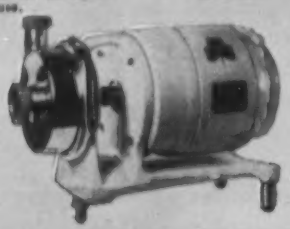
For all your LIQUID FERMENT and other Sanitary Line requirements . . .
Specify TRI-CLOVER Stainless Steel Fittings — Pumps — Tubing

Converted bevel seat sanitary fittings with Hycar gaskets form one of the proved joint types for liquid ferment processes.

Standard sanitary type fittings with acme thread design are available in a full line for baking industry use.



Tri-Clover valves are built in a wide range of types and sizes for every requirement.



Tri-Clover Sanitary Centrifugal Pumps are ideally suited for liquid ferment or other pumping requirements.

For over thirty-five years, Tri-Clover has specialized in furnishing sanitary, corrosion-resistant liquid conveying line equipment to the brewing, bottling, dairy and food industries.

In the complete line of Tri-Clover stainless steel fittings, valves, pumps and tubing, you will find the type you need to meet your piping and pumping needs for handling any of the liquid ferment, or brews as well as syrups, water, milk, liquid sugar, frosting and other baking liquids.

Tri-Clover fittings, valves, pumps and tubing have earned an enviable reputation for the highest quality materials and workmanship and have long met the most strict sanitary code requirements.

Our experienced engineering service is at your disposal to help solve your specific corrosion-resistant piping and pumping problems.

Call or write for further information.

LADISH CO.
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Kenosha Wisconsin

TRI-CLOVER

5455

Useful New Books & Government Publications

Front-Line Economy

How Foremen Can Control Costs *By Phil Carroll. Published by McGraw-Hill Book Co., 330 W. 42nd St., New York City 36. 1955. 301 pages. 5x7¼ in., cloth. Price: $4.*

Importance of the foreman in company economy is indisputable in industry. In this book the author explains how front-line management may approach the cost-control problem. Training, salvage, tools, maintenance, process changes, time studies, budgets, all are discussed as they effect the foreman.

Effectively illustrated with cartoons, the book is of value to the foreman interested in top performance of his job.

Language of Engineers

Dictionary of Mechanical Engineering Terms, *Seventh Edition. Published by Philosophical Library, Inc., 15 E. 40th St., New York City 36. 1955. 417 pages. 5¼ x 7½ in., cloth. Price: $6.50.*

Divided into two sections—modern terms and general and traditional terms, this dictionary is a must for the mechanical engineer. It closely approximates an encyclopedia of mechanical engineering practice in spite of its small size.

An attempt has been made to draw a fair dividing line between the terms found in mechanical engineering and those to be found in other related sciences.

The book has been completely revised to include the most up-to-date vocabulary.

Booklets & Reports

Stepping Up Efficiency in Packaging Materials, Handling, and Shipping. *Published by American Management Assn., New York City 36. 74 pages, paper. Price: $1.75 ($1 to members).* Papers presented at 1955 Packaging Conference.

ASTM Standards on Paper and Paper Products and Shipping Containers. *Published by American Society for Testing Materials, Philadelphia 3, 406 pages, paper. Price: $3.75.* Standards and tentative specifications, test methods, and definitions of terms.

Engineering Standards, Multiple V-Belt Drive. *Published by Multiple V-Belt Drive and Mechanical Power Transmission Assn., Chicago 3, and Rubber Manufacturers Assn., Inc., New York City 22. 24 pages, paper. Price: $1.* Complete rewrite of 1951 edition.

FE REPRINTS AVAILABLE

Difficult-to-find practical information on food plant operations and materials is available in the "roundup" reports and articles listed below. Single-copy reprint prices are given. For orders of 20 or more, there is a 25% discount. You order the reprints by circling the corresponding numbers on the Reader Service Coupon, inside the back cover. You will be billed when your order is filled.

8. Newer Ingredients.....$1.25

Twenty-page report on the newer ingredients which aid in producing better food products (May, 1952). It includes detailed articles on these subjects: (1) Guide to Optional "Chemical" Additives. (2) Antioxdants Provide New Flavor Controls. (3) Industrial Enzymes Now Speed Natural Processes. (4) Food Emulsifiers Bring New Highs in Uniformity. (5) Seaweed Extractives Find Versatile Uses in Foods.

9. Vacuum Cooling.....$0.75

Eight-page special report covering the use of efficient vacuum cooling in a wide variety of food processing operations to save costly process time, reduce labor, increase output, and avoid spoilage losses (October, 1952). Preference data for specific types of applications are presented in this engineering study.

10. Packaging Materials.....$1.00

Sixteen-page report on how to get better production-line performance with packaging materials and containers (March, 1952). It includes these comprehensive articles: (1) Developes Your Package for High Output. (2) How Properties of Materials Affect Packaging Speeds. (3) Nipping Production Slowdowns by Prechecking Supplies. (4) Tips on Ordering Materials for Top Performance. (5) Proper Storage of Your Stock Averts Line Headaches.

11. Sanitation $0.50

Six-page report on "How To Assure Top Sanitation in Your Processing Equipment" (Jan., 1952). This report was a preprint of one section of a practical book on food plant sanitation prepared by Association of Food Industry Sanitarians.

12. Materials Handling.....$1.00

Twelve-page report entitled "How Modern Materials Handling Gives New Spurt in Processing" (March, 1951). Case histories of important savings through more efficient handling are presented. And the different types of handling equipment are described and illustrated.

13. Mixing $0.50

Four-page roundup of progress in plant mixing methods and equipment, plus a forecast of what is ahead (Oct., 1952). Performance data are included as yardsticks of what can be achieved.

14. Aseptic Canning.....$0.75

Eight pages, including foldout picture flowsheet, describe, evaluate, and illustrate in detail the continuous, short-time, high-temperature aseptic canning process that won the 1951 Food Engineering Award. (June, 1951).

with Dow Corning Silicone Defoamers

Dow Corning Antifoam A* Compound and Antifoam A emulsions are the most efficient and versatile foam killers ever developed. Thousands of successful applications prove they increase productive capacity, reduce processing time, eliminate the waste and fire hazard of boil-overs. And all three, Antifoam A Compound[1]—Antifoam A Emulsion—Antifoam AF Emulsion[2], are effective at low concentrations. For example:

One Ounce of

. . . Antifoam A Compound kills foam in

35,000 lb
Vitamin B_2

. . . Antifoam A Emulsion kills foam in

1,245 lb
textile sizing

. . . Antifoam AF Emulsion kills foam in

2,075 lb
chocolate syrup

[1] Permissible in food processing at concentrations up to 10 ppm.
[2] Permissible in food processing at concentrations up to 32 ppm.

free sample

Test these versatile silicone defoamers at our expense.

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Please send me:

☐ Booklet on Silicone Defoamers; FREE sample of ☐ Antifoam A Compound ☐ Antifoam A or ☐ AF Emulsion;

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* T M DOW CORNING

New possibilities for continuous processing!

...with Foxboro sanitary proportional flow control

Foxboro Magnetic Flow Meter . . . transmits flow measurement to recorders or controllers.

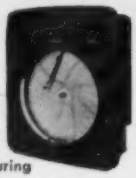
You no longer have to discard new ideas in continuous process design for want of adequate flow control! Foxboro now provides the first complete sanitary proportional flow control system ever available.

Heart of this system is the Foxboro Magnetic Flow Meter. It has proved highly successful in measurement of widely varied food products including beer, tomato products, apple juice, and grape juice. And it's equally applicable to many others, such as egg yolks, wine—even molasses! It measures *magnetically*, with no flow interference, no pockets, crevices, or projections to collect residue or contamination. And its high accuracy is sustained, despite variations in conductivity, density, and viscosity.

The Dynalog Controller and the Saniflo Valve complete the system . . . offer a complete sanitary control "package". Send us your flow control problem. Write **The Foxboro Company, 303 Neponset Ave., Foxboro, Mass., U.S.A.**

A complete, sanitary proportional flow control package

Foxboro Magnetic Flow Meter. Accurately measures the flow of virtually any liquid except non-conductors like chocolate, fats and oils. Installs easily in the line like any equivalent length of pipe. No taps, seals, purges, meter runs, or straightening vanes required. Connects by 2-conductor cable to remote Dynalog Controller.



Foxboro Dynalog Recording Controller. Responds instantly to changes in volume flow, initiates fast, accurate valve action to hold pre-set rate. Troublefree, stepless measuring circuit has no slidewire — requires no standardizing or batteries, practically no maintenance. Control action can be air-operated or electric-operated.

Foxboro 2-way Saniflo Control Valve. A streamlined valve for liquids, suspensions, viscous or pulpy materials. Equally effective for throttling (proportional) or open-and-shut control. One-piece stem and plunger — no threads or crevices to harbor bacteria. Quick-disconnect clamp for easy cleaning. Can be replaced in control system by other type valve or a pump to meet process requirements.

FOXBORO
REG. U. S. PAT. OFF.

SANITARY FLOW CONTROL

FACTORIES IN THE UNITED STATES, CANADA, AND ENGLAND

KEEPING UP WITH THE FIELD

Technical News • Washington Highlights • Economic Trends • Labor Developments

AMA Steps Up Food Studies

Increased activity in the field of nutrition standards and education can be expected in '56 by the Council on Foods and Nutrition of the American Medical Society, Chicago.

Council announces it will continue review of educational food advertising —those dealing in food categories without reference to specific brand names. When such advertising meets its standards, says the Council, permission will be granted to use a statement to this effect.

Further, emphasis will be placed on gathering factual information to further nutritional education. Conferences will be held on topics of current interest. And new nutrient standards for certain food classes will be developed.

Food Men Plan FDA Fetes

Organization of a food industry committee to help plan commemorative activities during the 50th anniversary of the Federal Pure Food Law is announced by Eugene H. Holemann, president, Association of Pure Food & Drug Officials of the U. S.

Siert F. Riepma, president, National Association of Margarine Manufacturers, has accepted chairmanship of the group. He will be assisted by over 30 prominent men from trade associations and the processing field.

Food Physics Conclave To Meet In Southwest

Application of physical science techniques to the food field merits particular attention today. And the subject will get thorough coverage at the first international Food Physics Symposium, to be held in San Antonio, Tex., Mar. 15-16.

Conference is sponsored jointly by Southwest Research Institute and the Institute of Food Technologists.

Among subjects to be reviewed are the new methods for preserving foods: Atomic sterilization, electrostatic smoking, radio-frequency heating, and ultrasonic processing.

Also slated for discussion are latest quantitative and qualitative measurement methods and automatic control instruments.

Plans Food Irradiation Pilot Plant To Treat 1,000 Tons a Month

A nuclear reactor especially designed for pilot plant studies in the preservation of food by irradiation will be constructed by the defense department with funds from AEC. It is expected that about 1,000 tons of irradiated food per month will be used for the next two or three years in connection with these studies.

The armed forces purchases about $2 billion per year in perishables. Refrigeration costs for the armed forces are estimated at approximately $40 per year per man. AEC figures that if radiation preservation of foods can lower the cost of perishable foods by one-fourth, there would be a potential savings of $20 million a year, based on a two-million man army. Savings to the domestic economy are estimated at least equal to that for the armed forces.

One of the big problems in irradiation of foods is how to kill the bacteria and not produce off-flavors, off-odors, or a breakdown in tissue structure of crispy vegetables. This problem is currently under study, and will be continued on a much larger scale when the proposed new plant is in operation. The present estimates of storage possibilities for perishables without refrigeration using a dosage of 2,000,000 rep. are as follows:

Good—bacon, beans (green), beef liver, broccoli, brussel sprouts, carrots, chicken, codfish cakes, pork, pork sausage, and waffles. These foods show enough promise to require not too much further work. The flavor changes are said to be minimal, and the products look good.

Foods showing fair promise and which will be subject to further study are: Apple juice, apple sauce, beefsteak, bread, cabbage, cherries, corn, halibut, ham, hamburgers, lamb chops, peas, spinach.

Beefsteak has shown a slight change in flavor and odor when irradiated. There has been a difference of opinion as to the change that has taken place. Some laboratories claim they cannot

(Turn page)

Experimental Truck Floats on Air—Gives Smoother Ride

Striking new truck suspension system—which replaces conventional leaf-springs with air-filled bellows—keeps truck body always at a constant height, and fully absorbs road jolts. Here, Philip J. Monaghan, General Motors Corp. vice-president, points to one of the levelling valves that controls pressure in bellows. Experimental GMC truck-and-trailer unit was seen for the first time at recent Chicago Automobile Show.

"Frozens" Top 4½-Billion Pounds in '55 Heat-And-Eats Biggest Ground Gainers

Booming frozen food sales registered a 10% gain in '55 to reach the whopping figure of 4,866,000,000 lb., according to a year-end survey by the National Frozen Food Distributors Association.

Practically all frozen products contributed to this increase. But prepared foods—particularly the heat-and-eat variety—were outstanding gainers.

This category jumped to fourth place in the overall picture with estimated sales totalling 625,000,000 lb. —up 39% over '54. Pot pies head the prepared products list at 150,000,000 lb. Indeed, these tasty frozen items now lead all other frozen foods, except orange juice, in dollar sales.

Other frozen, prepared food sales are estimated by the Association as follows: Potato products, 100,000,000 lb.; Fish sticks, 67,000,000; complete dinners, 50,000,000; waffles, 20,000,000; fruit pies, 15,000,000; other heat-and-eats, 223,000,000.

In an overall look at the field, vegetables again took first place, but increased only 1,000,000 lb. over '54 figures. A complete rundown follows (numbers in parentheses are for '54): Vegetables, 1,031,000,000 lb. (1,030,000,000); poultry, 875,000,000 lb. (900,000,000); fruit juices (concentrated weight), 829,000,000 lb. (751,000,000); prepared foods, 625,000,000 lb. (450,000,000); fruits, 531,000,000 lb. (501,000,000); seafoods (except fish sticks, listed under prepared foods), 384,000,000 lb. (312,500,000); Eggs, 341,000,000 lb. (361,000,000); and meats, 250,000,000 lb. (175,000,000).

The NFFDA gives fish sticks major credit for the 25% sales increase in seafood products this past year. Since its development three years ago, the new item has zoomed to '55 figure of 66,600,000 lb. Further, it has reawakened consumer interest in other fish products, too, thus increasing their sales.

Two reasons are listed by the Association for the relatively poor showing by frozen vegetables: Short packs in several items, with consequent high prices; and ferocious competition among all frozen foods for space in the inadequate store cabinets.

There is hope, however, that this latter factor can be solved. Fruit and vegetable packers have now started a research program aimed at developing a practical, multi-level display cabinet. Such an advance will go a long way toward solving the needs of all frozen food processors.

Irradiation Plant (Cont'd)

tell the difference between irradiated beef and unirradiated. Others say the odor is very undesirable. Intensive study will be made of this food.

In the poor column are listed bananas, lima beans, cheese milk, cantaloup, celery, frankfurters, lemon juice, lettuce, oranges, orange juice, squash, strawberries, syrup, and tomato juice.

One of the most difficult flavor problems is that of milk. Its odor also is not good after irradiation. It will be study to which much importance will be attached in the program ahead.

AOAC Names Chemists For Pesticide Studies

Appointment of 23 chemists to test and develop new methods for analysis of pesticide residues on foods is announced by the Association of Official Agricultural Chemists, Washington.

The scientists, all of whom are employed by the Food & Drug Administration, were named by AOAC to aid in enforcing the recent Miller Amendment to the Food, Drug, and Cosmetic Act.

Action was taken at the request of FDA, which needs further chemical tests to insure keeping residues of new pesticides below allowable tolerances.

At the same time, AOAC has issued an invitation to all industry chemists to participate in the test program. Interested researchers are urged to contact William Horowitz, secretary of the Association.

Announce Unique New Pole Bean Picker

Successful development of a mechanical pole bean picker is announced jointly by Food Machinery & Chemical Corp. and Association of Pacific Northwest Blue Lake Bean Processors. The new one-man unit straddles a row and picks both sides simultaneously. Bean clusters are gently broken up; product is cleaned, and then deposited in a hopper. The unique new machine does not destroy vines, thus making multiple pickings possible.

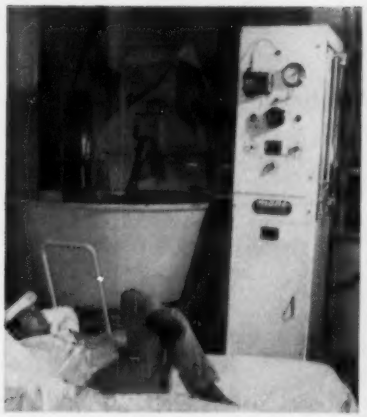
High Concentrate Wine Reaches Pilot Stage

Freeze concentration is being utilized in France to produce a highly condensed wine, said to keep better and longer because of the increased alcohol content.

The new product—which stems from a low-concentrate wine developed four years ago—is processed by first freezing out the water, then distilling resultant mixture. Final concentrate is a brownish-red liquid, syrupy and rather opaque, with 63% alcohol.

Packaging of the new item poses a serious problem, since it corrodes metals and combines chemically with plastics. Glass bottles and wooden kegs, while impractical from a handling standpoint, may be the only solution.

Trial production of the new wine is slated to start in 1956. French Army supply services are interested in the concentrate because of its space-and-weight saving features. They plan to package product in individual portions and issue it to troops.



Reveals "Sleeping Baker"

Labor saving features of a new British machine called "The Sleeping Baker" are dramatized. The automatic control device (right) measures and heats water, switches on mixer, adds water, then cuts off mixer after timed cycle is completed. Device is manufactured by D. Ayers Jones & Co., London.

Hors d'Oeuvres

► Heinz recently market-tested a jar that you could get ketchup out of. So what happens? The old bottle outsells the new wide-mouthed one 17 to 1 in the small size and 33 to 1 in the large. Would you blame Heinz if they asked you to keep your wide mouth shut on the ketchup complaint?

► **Peppermints are being printed with company slogans and sales messages. Do we even have to eat commercials?**

► Many cheese lovers consider the processed product a poor substitute. Now comes imitation process cheese to the market. How far can this thing go?

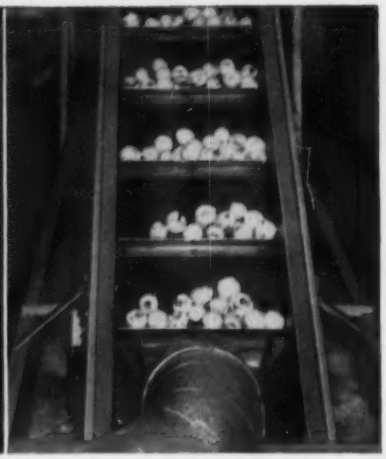
► **Rutgers replaced rats with confused flour beetles in trace-mineral studies. The bugs took only 1 sq. ft. of space, ate but 1 lb. of food in 25 days, and took practically no care. The confused beetle idea was straight thinking.**

► Barney Baruch suggests an answer to the farm problem. It is to store all food surpluses against a rainy day. This still would wash the taxpayer's money down the drain.

► **You might enjoy the new food-flavored novel, "The Giant," by Fred Laing. Principal character is the hard-dealing head of a great fictional food chain. And the book won't cure your insomnia if you sell to chains.**

► In tests made at Rutgers by Walt Maclinn, food editors tasted pies frozen before and after baking and voted 19 to 1 for the former. But 10 hungry boys detected no difference. Maybe it depends upon how well you like pie.

CAMPBELL VACUUM PACK
MEAT AND FOOD WRAPPER
PAYS FOR ITSELF IN LESS THAN
SIX MONTHS TIME ON JUST
MATERIAL & LABOR SAVINGS!
Fast, automatic CAMPBELL wrapper saves up to 60% on vacuum drawing packaging films and materials
No question about it — the CAMPBELL Vacuum-Pak's simplified one person operation; its close-fitting vacuum drawn wrap which requires no trays or stiffeners, unless desired — ACTUALLY saves enough money on materials and labor alone over competitive methods to pay for itself in 4 to 6 months time! In addition, the product's tight wrap minimizes puncture risk and is vacuum guaranteed.
Used by America's leading packers, this ingenious automatic vacuum wrapper packages sliced luncheon meats, bacon, chops, patties, wieners, cheese and other food products with equal ease and speed. Simple adjustments require minimum down-time for product change-over. Get complete cost and production facts today.
POSITIVE Guaranteed SEALING
• 98% of packages positively sealed and guaranteed.
• Vacuum drawn wrap eliminates shrinkage, flavor and color loss.
• Tremendous savings in wrap materials and labor.
• Delivers 40 to 70 Units per minute
• Extends product's shelf life—reduces spoilage and returns.
• Close wrap reduces puncture risk.
Less than 2% package "Leakers"
It is hereby guaranteed that out of every 100 units Vacuum-packed on a CAMPBELL Vacuum Pack Meat and Food Wrapper in regular production service — 98% or more will be positively sealed against leakage at sealing areas of heat-sealing wrapping material used for the package.
HUDSON-SHARP MACHINE CO.
GREEN BAY, WISCONSIN
GET THIS FREE BROCHURE
There's a Campbell Wrapper for packaging hundreds of fresh and frozen food items. Write for full colored descriptive brochure today on your company letterhead.
Campbell
WRAPPER
HUDSON-SHARP MACHINE CO. • GREEN BAY, WIS.
Manufacturers of Aniline and Gravure Presses, Folders, Interfolders, Laminators, Waxers, Embossers, Slitters, Sheeters, Roll Winders, Packaging Machines, Crepers and Tissue Converting Units.
NEW... Campbell-Pak
Another first — converts roll stock to low cost filled and heat sealed bags for manual or automatic sequence packaging of liver, brains, kidneys, tongue, kraut, cheese and other products. Write for descriptive literature on this entirely new method packaging machine.



UNIFORM SANITARY CANNING

WITH *Cambridge* WIRE MESH CONVEYOR BELTS

Regardless of what fruit or vegetable you're processing and canning, you'll get a higher quality, more uniform product by carrying out most of your operations on sanitary, damage-reducing wire mesh belts. While continuously moving raw or cooked stock, whole or sliced, through your plant, Cambridge Wire Mesh Conveyor Belts eliminate most manual handling in peeling, coring, washing, cooking, canning and shipping. Open mesh permits forced washing, rapid drainage and free circulation of steam and air. Write for detailed discussion of how Cambridge belts speed production and maintain sanitary requirements.

No matter what food or process...

. . . meat, poultry, candy, fruit or produce . . . canning, freezing, baking . . . Cambridge Wire Mesh Conveyor Belts can reduce your operating costs and increase product quality by continuous uniform processing with reduced manual handling. Lifelong rust protection, quick drainage of process solutions, lack of odor and freedom from contamination are only a few advantages. All-metal belt is impervious to damage from heat and cold. There are no sharp edges because Cambridge belts are woven from round wire.

Cambridge Wire Mesh Conveyor Belts are made in any size, mesh or weave, and from any metal or alloy. Special raised edges or cross-mounted flights to hold your product during inclined movement are available.

Call in your Cambridge FIELD ENGINEER to discuss how you can cut food processing costs by continuous operation. Look under "BELTING, Mechanical" in your classified phone book. OR, write for FREE 130-PAGE REFERENCE MANUAL illustrating and describing wire mesh conveyor belts. Gives mesh specifications, design information and metallurgical data. Ask for Special Industry Folder on your operation.

The Cambridge Wire Cloth Co.

WIRE CLOTH | METAL CONVEYOR BELTS | SPECIAL METAL FABRICATIONS

Department Q,
Cambridge 2,
Maryland

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

Meats Hit Record High

Production of meats soared to a new record of 26.8-billion pounds in 1955—1.5-billion pounds over 1954's output, declares J. Morrell Foster, chairman of the board, American Meat Institute, Chicago.

And with no heavy warehouse stocks hanging over the market, he predicts even bigger production—fully 27.2-billion pounds—for '56.

Chairman Foster cites pork, which rose from 10 to 11-billion pounds in '55, as main factor in the increased meat production. Beef reached 13.6-billion pounds, only a 2% rise over '54 figures (13-billion).

FDA Head Urges New Law

Need for a regulation governing chemical additives in foods is underlined by George P. Larrick, Food & Drug Commissioner.

In addition to proving that the chemical is not a health hazard, Commissioner Larrick urges that the law require manufacturers to prove usefulness of an additive before it is put into foods.

Adopt New Kraut Grades

Processors and buyers of sauer kraut will have a fresh basis of understanding with adoption of new kraut standards this year, states the National Kraut Packers Association, Chicago.

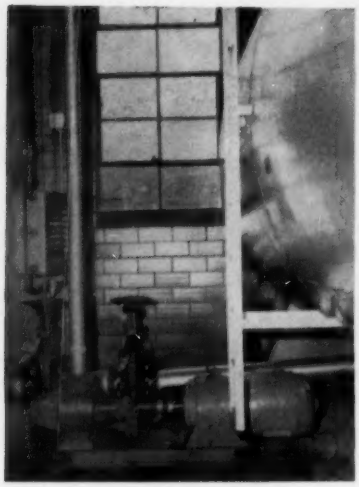
Developed by a team of Association packers working under the direction of Dr. Carl S. Pederson (N. Y. State Agricultural Experiment Station), these latest rules introduce a number of new testing and recording techniques. Five chief grading factors have been established to gage quality: Flavor, color, cut, character, and defects.

It is hoped that the new standards, by giving a broader product breakdown, will help packer and buyer alike, establish premium values for highest-quality products, says NKPA.

Processors Win Citations

Thirteen prominent food companies have been cited as "Excellently Managed" by the American Institute of Management in its annual analysis of U.S. and Canadian business.

Companies named are: Great Western Sugar Co., General Mills, Inc., General Foods Corp., Corn Products Refining Co., Coca-Cola Co., Campbell Soup Co., Borden Co., Swift Co., Quaker Oats Co., National Biscuit Co., Kellogg Co., Beatrice Foods Co., and American Chicle Co.



Opens Corn Syrup Station

Modern, sanitary handling of bulk corn syrup is featured at this loading station, opened by Hubinger Co., at St. Johnsville, N. Y. Formerly a milk plant, the new facility has covered docks for loading tank trucks, and adequate space for charging barrels, which are shipped by rail. Unit heaters (as above) keep 43-deg.-Brix product at 100 F. to insure clarity. Tank (right) holds 250,000 lb. of syrup.

Slates Instrument Forum

Processors have the opportunity to learn newest methods of automatic control at a three-day food industry instrument forum, scheduled by Foxboro Co., at Foxboro, Mass., Mar. 19-21.

Main theme will be application of instruments to produce a better product at lower cost. And special attention will be devoted to unique new graphic panels that centralize process control.

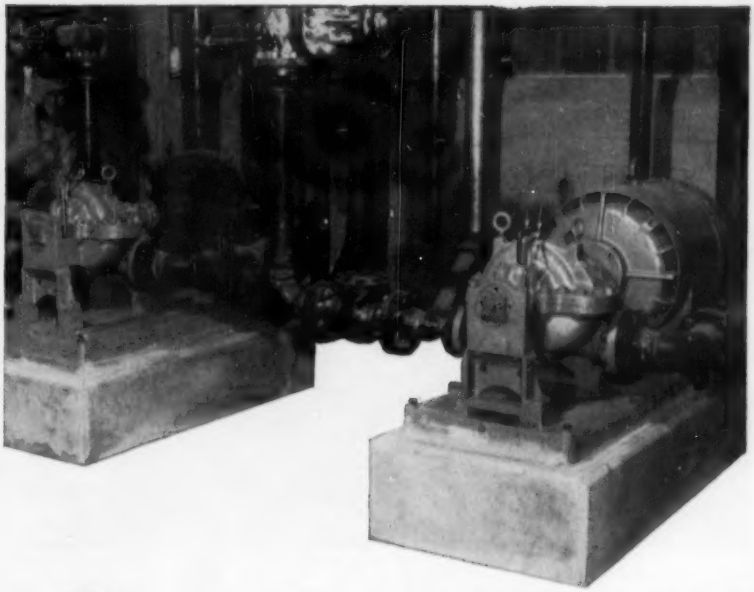
Offers Food Courses

Three evening courses in food engineering will be offered for the spring semester, announces Illinois Institute of Technology, Chicago.

Two undergraduate courses will stress agricultural and nutritional factors in food production, and elementary analytical methods. The single graduate course will emphasize advanced food processing techniques.

World Food Shorts

Russia calls for decisive action to eliminate a "lag in technology" in its food industry. Pravda, charging the Ministry of Machinery & Instruments with repeated failure to meet plans for new-



Two Goulds 2 x 3—9 Fig. 3305 two-stage centrifugal pumps on boiler feed service. These pumps are available in five sizes with capacities to 1200 GPM, heads to 1000 ft.

7 *design features*

improve pump operating efficiency

Every one of these features is *standard* with this new Goulds Fig. 3305 two-stage centrifugal pump:

1. **Renewable stuffing box bushings.**
2. **Bearing housings sealed against moisture and dirt.**
3. **Cowl-type glands suitable for use with quenching liquids.**
4. **Stainless steel impeller keys.**
5. **Teflon water-seal rings.**
6. **Die-formed stuffing box packing.**
7. **Corrosion-resistant gland bolts.**

Together, these seven construction features give you, without extra cost, a quality of service that's unique in general liquid-handling pumps.

The Fig. 3305 offers other advantages, too. For example, you can choose either a conventional stuffing box or a mechanical seal—and change from one to the other at any time. Also, extensive interchangeability of parts helps keep your parts inventory low.

Bulletin 722.6 gives the complete story of Fig. 3305 advantages, including specifications, performance curves, and interchangeability charts. Write for a copy.

MEMBER

Goulds PUMPS INC. Seneca Falls New York

ATLANTA • BOSTON • CHICAGO • HOUSTON • NEW YORK • PHILADELPHIA • PITTSBURG • TULSA

DAY JUMBO MIXERS . . . meet every requirement for maintaining a thorough blend of chocolate products under sanitary conditions at The Nestlé Company, Inc., Fulton, N. Y. For instance: seals may be furnished of sanitary construction requiring no packing, and of such simple design as to permit thorough cleaning in a matter of minutes between batches—(no more black specks working into product from stuffing boxes).

Outboard bearings on all models allow plenty of room for normal cleaning and maintenance. Special agitators available for blending high shortening content products. Heating or cooling jackets, dust covers and many other optional features available. For complete information write for Bulletin 800.

FOUNDED 1892

in mixing equipment **DAY** *means longer life span*

THE J. H. DAY COMPANY
INCORPORATED
4932 BEECH ST., NORWOOD, CINCINNATI 12, OHIO
Division of Cleveland Automatic Machine Company

Quality equipment for baking, paint and varnish, printing ink, chemical, rubber, pharmaceutical, cosmetics, paper and pulp, explosives, food, ceramics, candy, soap, sugar and milk products.

Eastern Canada: Brantford Oven & Rack Co., Ltd., Brantford, Ontario
Western Canada: British Canadian Importers, Vancouver, British Columbia
Mexico: T. de la Pena e Hijos, S.A., Nazas 45-A, Mexico 5—D.F.

machinery development, cites obsolete equipment as reason for an annual loss of thousands of tons of sugar.

Date syrup will be imported from Iraq to meet increasing U. S. demand. Agent is Thomson Trading Co. Ltd., Los Angeles.

New malt plant at the Leeds brewery of Joshua Tetley & Son Ltd., England, handles 40 tons of barley per hr. A superior product reportedly results from use of latest processing methods.

More fresh meat will be available to Colombians through a new preservation system. Antibiotic technique, developed by American Cyanamid Co., N. Y. C., keeps meat fresh for at least three days without refrigeration, even in tropical climates.

Frozen foods are on the increase in Sweden, according to its Deep-Freeze Assn. in Stockholm. There are now 9,000 retail outlets handling 130 frozen items. Consumption, estimated at 25,000,000 lb. in '55, is expected to surge to 85,000,000 lb. by 1960.

U. S. canning equipment will be sought for a proposed Egyptian plant, planned for an annual capacity of 8,000,000 tins.

New peanut harvester, being developed at the Israel Institute of Technology, Haifa, is expected to minimize shell damage in machine picking of eating-quality nuts. — *McGraw-Hill World News.*

Briefly...

● COCOA BEAN GRINDING in 1955 fell below both '54 and '53 figures, estimates Clive C. Day, president, Association of Cocoa & Chocolate Manufacturers. He calculates last year's production at 420,000,000 lb. Total grindings in '54 and '53 were 434,000,000 lb., and 526,000,000 lb. respectively.

● INITIAL SUGAR QUOTAS for 1956 will be 8,350,000 tons, announces USDA. This compares with final '55 quotas of 8,500,000 tons.

● PROCESSING CROPS, of the 11 principle vegetables, totalled 6,140,000 tons—4% over '54 totals—despite decreased acreage (2%) and generally poor weather, says USDA.

● CONSOLIDATED FOODS CORP. sales hit $113,120,885, during first 24 weeks of the current fiscal year, says S. M. Kennedy, president. This is a 15% gain over '54 figures ($98,577,730).

● COPPER SHORTAGES may be relieved in '56, predicts Electrical World,

a McGraw-Hill publication. Optimism is based on wide production expansion and development of new mines. Estimated world production in '55 is 2,700,000 tons. Goal for '56 will be 3,000,000 tons.

● ORIENTAL FOODS have a potential market of $50,000,000 in the immediate future, says Jeno F. Paulucci, president, Chun King Sales, Inc. He bases figure on rapid sales expansion of these specialties from $5,000,000 in '47 to the '55 high of $25,000,000.

● SAFETY BELTS are now being tested in trucks of two large interstate lines. One company's experience with the device shows that in seven serious accidents, six drivers escaped injury. The seventh driver was not using his belt.

● FROZEN FOOD FIELD is being invaded by Francis H. Leggett Co., which announces introduction of a frozen concentrated orange juice under its Premier label.

● A BIG MERGER took place recently when Northwest Canners Assn. and Northwest Frozen Foods Assn. voted to combine. Duplication of membership and objectives are given as reasons for the joint effort.

Action on Standards

Listed below are actions taken by the Agricultural Marketing Service (AMS) and the Food & Drug Administration (FDA) on U. S. Standards and allowable tolerances of various pesticides on raw agricultural commodities. References are to the *Federal Register*.

Poultry, AMS proposed amendment U. S. Standards, *F.R.*, Dec. 31, p. 9896.

Shell eggs, AMS proposed amendment U. S. Standards, *F.R.*, Dec. 23, p. 9894.

Orange juice, chilled, AMS proposed U. S. Standards, *F.R.*, Dec. 24, p. 9970.

Beans, AMS proposed amendment U. S. Standards, *F.R.*, Dec. 31,, p. 10164.

On Mushrooms, tolerances of Lindane, *F.R.*, Dec. 15, p. 9428.

On citrus fruits, tolerances of sodium-o-phenylphenate, *F.R.*, Dec. 20, p. 9508.

For sweet chocolate; milk chocolate; skim milk chocolate; buttermilk chocolate; mixed dairy product chocolates; sweet chocolate and vegetable fat coating; sweet cocoa and vegetable fat coating; pasteurized process cheese spread; pasteurized cheese spread; pasteurized process cheese spread with fruits, vegetables, or meats; pasteurized cheese spread with fruits, vegetables or meats; pasteurized Neufchatel cheese spreads with other foods; cold-pack cheese food; cold-pack cheese

BOTHERED WITH MOISTURE WHEN CONVEYING food products?

TON TEX

Then use water-resistant WHITE Conveyor Belting!

Built for the sanitary handling of foods, fruits and vegetables free from oils, White Conveyor Belting resists moisture. Does not impart odor or taste to products conveyed. A non-toxic, white belt made in 5 and 7 ply construction with $\frac{1}{32}$" conveyor cover and friction surface back. Withstands mild abrasion. Easy to clean. Makes an ideal "picker belt." *Write for details.*

Other TON-TEX Belting for conveyor jobs

STANDARD for food products, packaged goods, bottles and light, non-abrasive containers and materials.

PUR-O-TEX is a white, non-toxic belt for handling foods, fruits, vegetables. Resists oil, grease, water and heat.

CLAW TOP has gripping capacity to convey products up or down inclines.

TON-TEX CORPORATION, GRAND RAPIDS 2, MICH.

31 COLUMBUS AVENUE, ENGLEWOOD, NEW JERSEY — 759 W. SAN CARLOS STREET, SAN JOSE 26, CALIFORNIA

TON-TEX CONVEYOR AND TRANSMISSION BELTING

TON TEX

AUTO-LITE

for EYE LEVEL READING

Auto-Lite Temperature Indicators are ideal for use in processing and storage rooms, and for installation on equipment where temperature indication is desirable.

Model F-1 (illustrated) is available with maximum visibility dial; choice of temperature ranges from minus 60°F to plus 750°F; flexible tubing for remote reading or rigid stem for direct mounting. Adjustable electrical alarm contacts slightly higher. Priced from $22.

Send for new catalog describing Auto-Lite Temperature Indicators and Recorders.

THE ELECTRIC AUTO-LITE COMPANY
INSTRUMENT AND GAUGE DIVISION
TOLEDO 1, OHIO
NEW YORK • CHICAGO • SARNIA, ONTARIO

TEMPERATURE INDICATORS AND RECORDERS

PREST-O-MATIC®
ELECTRIC COLD STORAGE DOORS

are FAST, SAFE and AUTOMATIC

Truck passage through doorways is completed in 8-10 seconds. Truck operator does not stop forward motion as doors open and close automatically by remote control. Electrically operated doors slide open or shut in as little as 2½ seconds. Safety edge opens doors automatically if closing upon obstruction.

Users report increased efficiency in moving goods—"open-door-time" is reduced up to 75%, resulting in substantial savings in refrigeration and maintenance of lower temperatures.

PREST-O-MATIC doors are complete, packaged units, easily installed against any wall opening without loss of floor space. Full width of doorway is usable.

Send for complete information or consult your architect.

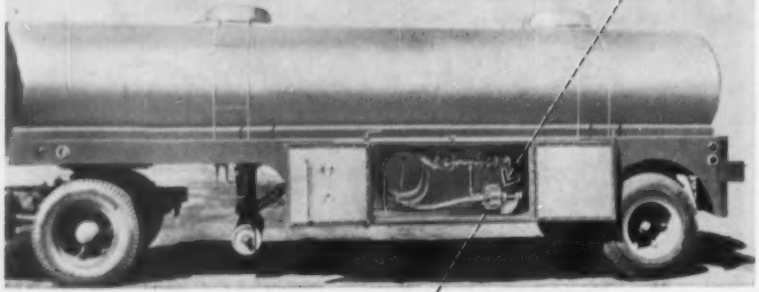
FINE DOORS SINCE 1878

CLARK DOOR CO.

505 HUNTERDON STREET, NEWARK 8, N. J.

Stainless and Steel Products Company find

VIKING "SANITOR" PUMPS



ARE THE ANSWER

Viking "Sanitor" Pumps are installed by Stainless and Steel Products Co., St. Paul, Minnesota on their big milk and liquid food transports. Follow their example. Profit by use of 90 GPM, 3A-approved "Sanitors".
Stainless & Steel Products Co. readily mounts the Viking "Sanitor" pump in their sanitary side cabinet with power and drive in separate compartment. It speed up delivery to and from their transport tanks. It cuts weight by 100 lbs. from many conventional units. It delivers in smooth, even flow. It is the answer to many of their customer's problems.

Send today for complete information on the entire line of Viking "Sanitor" pumps. Ask for catalog Section Fe.

VIKING PUMP COMPANY

Cedar Falls, Iowa U. S. A. **In Canada, it's "ROTO-KING"**

See our catalog in Sweets

food with fruits, vegetables, or meats; canned peaches with rum; canned apricots; canned apricots with rum; canned pears with rum; canned cherries with rum; canned cherries; canned cherries with rum; canned fruit cocktail; fruit butter, fruit jelly; preserves; and catsup; FDA Standard of Identity, *F.R.*, Dec. 21, p. 9820.

On currants, gooseberries, peanuts, Barley, corn, oats, rice, rye, sorghum grain, and wheat, tolerances of Methoxychlor, *F.R.*, Dec. 21, p. 9821.

On barley, hops, oats, olives, pea forage, vetch and wheat, tolerances of Parathion, *F. R.*, Dec. 21, p. 9821.

On sweetpotatoes, tolerances of Chlordane, *F.R.*, Dec. 21, p. 9821.

On apples, pears, quinces, eggplants, onions, tomatoes, beets, rutabagas, turnips, barley, beans, green beans, lima beans, snap beans, black-eyed peas, cocoa beans, corn, grain sorghum, oats, rice, rye, wheat, potatoes, and sweet potatoes, tolerance of methyl bromide, *F.R.*, Dec. 21, p. 9822.

On peaches, tolerances of glyodin, *F.R.*, Dec. 21, p. 9822.

For Swiss cheese, Probolone cheese, Caciocavallo Siciliano cheese, Parmesan cheese, Romano cheese, Asiago fresh cheese, blue cheese, and Gorgonzola cheese, FDA Standards of Identity, *F.R.*, Dec. 23, p. 9954.

On apples, tolerances of Thiram, *F.R.*, Dec. 23, p. 9955.

Schedule of Events

February

15–17—American Management Assn., personnel conference; Palmer House, Chicago.
16—Dairy Products Improvement Institute, annual meeting; Hotel Commodore, New York City.
18–26—International Food Show; former Wanamaker store, New York City.
20–24—Tri-State Packers' Assn., Institute of Food Technologists, and American Society for Quality Control, annual food processors' workshop; U. of Maryland, College Park.
29–M2—Western Candy Conference & Exposition; Sheraton-Palace Hotel, San Francisco.

March

1– 2—Dairy Industries Supply Assn., annual meeting; Hotel Commodore, New York City.
2– 3—Baking Industry Sanitation Standards Committee; Edgewater Beach Hotel, Chicago.
5– 8—American Society of Bakery Engineers, annual meeting; Edgewater Beach Hotel, Chicago.
13–14—National Dairy Eng. Conference; Michigan State U., E. Lansing.
15–16—Institute of Food Technologists and Southwest Research Institute, international symposium—physics in the food industry; Plaza Hotel, San Antonio, Tex.
15–16—American Institute of Industrial Engineers, conference on automatic controls, Cleveland.

4-Way Insect Control

—Continued from page 50

as a repellent, but in any event keeps the beetles from actually coming out into the cracks where edible dust has settled. And in many instances it may actually act as a killing agent.

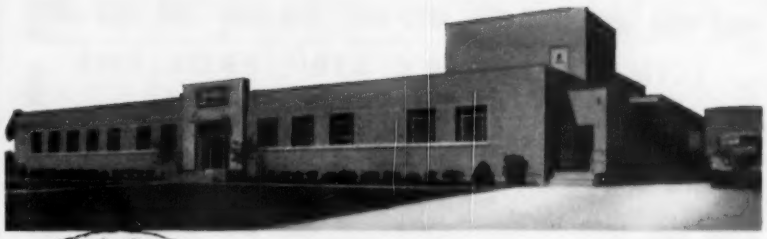
4. Vs. Flying Insects

Curbing of flying insects involves several different control steps. Primarily, fly control is based on good sanitation and housekeeping, supplemented by use of chemicals both for cleaning and for destroying insects and rodents.

Generally, flies are controlled by: (1) Checking them outside of plants (particularly at source of breeding), (2) preventing their entrance into plants, and (3) destroying those that do enter.

Optimum control of houseflies, blowflies, and even smaller flying insects calls for a well-formulated program—not merely occasional spraying when these pests become bothersome.

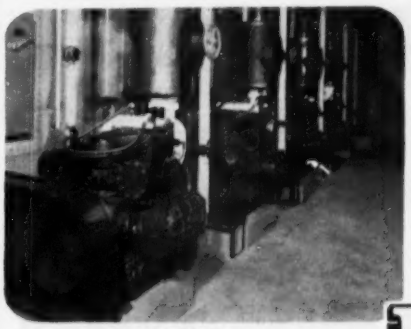
First step is to eliminate breeding sources and kill eggs and larvae before they mature. It is noted that house-



TRADE FRICK MARK®

Refrigeration

Carries the entire cooling load at the great new West Side Plant of the Detroit Creamery Co., handling 30,000 gallons of milk daily.



Five Frick "ECLIPSE" Compressors at Detroit Creamery Co.

Here five Frick "ECLIPSE" compressors make 60,000 pounds of ice at night for chilling water, cool two huge milk storage rooms, and refrigerate five cold-wall storage tanks. Installation by the Michigan Ice Machine Co., Frick Distributors at Detroit.

Frick refrigerating, ice making, air conditioning or quick-freezing equipment can solve your cooling problems with equal efficiency. Let us quote on your needs. Write

DEPENDABLE REFRIGERATION SINCE 1882

FRICK CO.

WAYNESBORO, PENNA. U.S.A.

STEEL

Every Kind

Quick Delivery

Plates, Structurals, Bars, Sheets, Tubes, etc. Carbon, Alloy, Stainless Steels, Babbitt Metal.

RYERSON

Joseph T. Ryerson & Son, Inc. Plants at: New York • Boston • Wallingford, Conn. Philadelphia • Charlotte, N. C. • Cincinnati • Cleveland • Detroit • Pittsburgh Buffalo • Chicago • Milwaukee • St. Louis Los Angeles • San Francisco • Spokane Seattle

Low in cost . . . Long on service

LA PORTE

FLEXIBLE STEEL

CONVEYOR BELTING

Here's your answer to rising food handling costs! La Porte's original cost is less than comparable types.

Maintenance is no problem—open mesh feature makes it easy to sterilize with steam or scalding water while in motion. Simple interlocking construction for fast, inexpensive replacement of any number of sections. Less downtime.

And in performance, versatile La Porte really shines! FLEXIBILITY knocks out creep, weave, jump and slippage. Provides smoother, perfectly flat surface for moving products or containers.

Better specify LA PORTE—the belt that costs less, lasts longer!

LA PORTE

Write TODAY for illustrated literature, prices.

MAT AND MFG. CO.

BOX 124 La Porte, Indiana

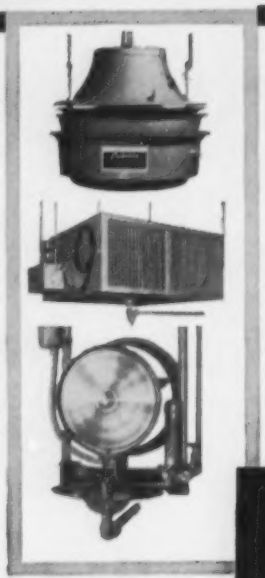
ELIMINATE "DRY AIR" PROBLEMS WITH LOW-COST

HUMIDITY CONTROL

TYPE E
Ideal for small areas; evaporates up to 3 gph with ¼ hp motor.

TYPE BA
For large areas; water or steam units with capacity to 30 gph

TYPE H
Centrifugal humidifier; evaporates up to 8 gph with ¼ hp motor.



Reduce spoilage and dehydration — improve storage and packing conditions . . . with *automatic humidification!*

Bahnson Unit Humidifiers

- A size and type for every processing need
- No floor space: units suspend from ceiling
- Economical operation— as little as $10 per unit per year
- Automatic controls — single or multiple installations
- Complete capacity range; wide choice of units

FREE! Get full details on entire line in Catalog F-5.

Bahnson COMPANY
WINSTON-SALEM, N. C.

AIR CONDITIONING • HUMIDIFICATION

Metso Shortens Clean-up Time

Crews finish in record time when Metso Detergent is used. Metso lifts the toughest greasy film and dirt, floats them away; prevents removed dirt from redepositing on cleaned surfaces.

Let Metso give you a hand with clean-up.

• *Metso Detergents available in over 70 cities.*

PHILADELPHIA QUARTZ COMPANY
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Metso Detergents
FOR FOOD INDUSTRY CLEANING

Modernizing Conveyor Lines?

CHECK Weld-Bilt STEEL-BELT CONVEYORS

Custom-engineered to your exacting needs, Weld-Bilt "moving belts of interlocking steel — or stainless steel" offer profitable advantages. Positive tracking, they connot weave, buckle, stretch or creep. Friction-free, they run on ball bearing rollers, from positive slip-proof motor drive. And, best of all, they offer *unlimited life.*

Call a Weld-Bilt engineer to help you plan new conveyor lines — or other modern materials handling equipment. Just drop a note.

SEE OUR EXHIBIT AT MATERIALS HANDLING SHOW JUNE 5-8 — BOOTHS 210-212-309-311.

WEST BEND EQUIPMENT CORP.
MATERIALS HANDLING ENGINEERS
349 WATER STREET, WEST BEND, WISCONSIN

flies usually breed close to the plant and in damp nutritive material. Once discovered, these breeding sites should be eliminated by better surfacing of driveways, covering garbage, quickly disposing trash, etc.

Spots where eggs and larvae are likely to breed, as in milk spillage around a dairy, should be treated with a water-miscible insecticidal larvacide concentrate. This can be applied from a sprinkling can.

Houseflies build up resistance to certain insecticides. It has, therefore, become necessary for food plants to readjust their fly-control programs so as to take advantage of new insecticides against which the flies have not yet built up an immunity.

One such is malathion, an organic phosphate. Combined with attractants such as butyric acid, sugar, lactose, and milk whey, as well as certain odor elements, it is residually applied to outside surfaces where flies roost. This attracts them to the treated surface, where they feed on the material and shortly die. Application lasts many days, and it is ideal for loading docks, trash disposal areas, etc.

Malathion, with special insect lures or attractants, can also be impregnated in small flakes or grits. These granules can then be sprinkled about the ground to attract and kill flies.

Fly food sources outside of the plant should also be covered or removed. Moreover, outside premises should be kept free of weeds, which serve as fly harborages. This can best be done by using one of the new weed-killing soil sterilants, which keep the grounds free of weed growth for a full season.

Then, when as many flies as possible have been killed on outside premises, by following the above procedures, next steps are to make the plant a fortress, designed to check entrance of flies.

Screening should be 16-mesh, rather than 14 to 12, to prevent entrance of small flying insects. Doorways should have self-closing devices. Openings should be reduced to a workable minimum so as not to serve as an excessive invitation to flies.

Conveyor inlets can be protected by black painting of tunnel interiors, steam jets across the openings, or dangling chains. Automatic spraying of vestibules, just inside entrance doors, has proven effective.

Unfortunately, many openings must remain exposed a portion of the time. These are best protected by fly-chaser fans, which provide a movement of air over the opening so as to make it difficult for these pests to fly in.

Although complete success with fly fans is impossible, a properly chosen, correctly installed fan can be about

90% effective. Best way to achieve top fan performance is to use a velocity meter to check all corners of the opening so that the fan can be adjusted to give maximum protection.

As further safeguards, such insecticides as the 3% methoxychlor-½% lindane formulation should be residually applied to walls of non-processing rooms also in corridors, as well as storage and garage areas. This way, flies can be destroyed before they get into processing areas.

To curb those flies that do enter the food processing room, space spraying or nightly fogging procedures should be carried out.

Object here is an immediate knockdown of flies, plus a sure kill. Many insecticides, particularly those high in pyrethrum, will knock down flies. But unless synergists or sure-killing ingredients are included in the formula, many of the knocked-down pests will later recover and fly away.

It is necessary to use an insecticidal formula that will achieve maximum success against resistant as well as non-resistant houseflies. Unfortunately, it appears that resistance of the flies to these insecticides is changing almost every year so that formulas will have to be adjusted year by year.

A year ago, for example, we exposed a series of resistant and non-resistant houseflies to over two dozen insecticidal formulas. We found the one giving maximum quick knock-down and ultimate sure-kill comprised methoxychlor, allethrin, and the synergist Octicide 264. But recently, this formula has performed poorly against resistant houseflies.

However, it appears that the combination of pyrethrins, synergists, Octicide 264, and pipernoyl butoxide will now give results. In any event, it is well for food-plant sanitarians to beware of these changes so that they will be employing the best formulas in line with the latest checks.

Plant men are cautioned that fire and explosion hazards are created when space sprays are utilized so that large areas in food-processing plants are virtually 100% vaporized with a finely atomized insecticide. It is imperative that such insecticides exceed 160 F. flash point to avoid this risk.

In this space spraying or fogging, use of proper equipment is almost as important as use of the proper insecticide. Tests prove that size of vaporized droplets of insecticide should average 15-30 microns to remain suspended in air for long periods (not wastefully precipitate on floors) and to most readily penetrate insect bodies. Such a specified vapor can be achieved by either permanently installed overhead or portable spray units.

End (Resume reading on page 51)

Letters to the Editor

FDA Will Cooperate In Celebration

Dear Sirs:

Returning to the office after a two weeks' absence, I found the November, 1955, issue of FOOD ENGINEERING on my desk. The editorial on Page 116 is splendid.

We do hope to participate with industry in a dignified celebration of the fiftieth anniversary of food and drug legislation in this country. Your editorial is practically a blueprint for an appropriate celebration on this occasion.—*George P. Larrick, Commissioner of Food and Drugs, Washington, D. C.*

COMMENT—This kind of cooperation will make make it easy for manufacturers and associations to plan celebration activities.—Editor.

Food Officials Make Anniversary Plans

Dear Sir:

I have just finished reading your November editorial. When the Association of Food and Drug Officials of the United States elected me as their president in May of this year, I immediately appointed a committee to develop and help execute celebration plans commemorating the 50th Anniversary of the passage of the Wiley Food and Drug Act.

The committee, and our full membership, were told that here was the opportunity—so long needed, by officials in state, federal and municipal governments and the food, drug, cosmetic and chemical industry—to tell the public the story of cooperation and endeavor.

From the first, I have always insisted, and do so now, that industry as well as regulatory officials, share equally in recognition of the tremendous progress made.

It was with pleasure, therefore, that I learned of your well expressed views on this "Golden Anniversary."—*Eugene H. Holeman, President, Association of Food and Drug Officials of the United States, Tennessee Department of Agriculture, Nashville.*

COMMENT—The editorial urging food manufacturers to celebrate the 50th anniversary of the pure food law was inspired by the preliminary plans of the Food and Drug Officials. We learned about them during a trip to Georgia last fall. These plans triggered the thought that our industry should publicize the anniversary and call attention to the safety and high quality of manufactured and processed foods.—The Editor.

How-To Regulations Stymie Progress

Dear Sir:

Congratulations on your fine editorial in the November issue of *Food Engineering*. The opportunity you have pointed out should pay big dividends to the food industry.

There has been substantially increased activity in the past few years to broaden the police power of the FDA. This tendency can be very dangerous when it is set up in the form of "how to" regulations, rather than specifications which products must meet. Unfortunately, there are substantial elements in the food industry who would prefer to see "how to" regulations go into effect, because this sort of control relieves them, to a great extent, of responsibility for end-product control.

Surely the deeper thinking, conscientious powers in the food industry want to see their business left as free as possible to result in newer, better, more appealing and safer food products. "How to" regulations lead to defining the type of building, the type of machine, the type of package, and the sort of ingredients that may be used. Such regulations become stiffer than the proverbial rusty hinge.

The stiffling nature of "how to" regulations is not a supposition. It is an objectionable fact. Meat inspection has been conducted for many years under "how to" regulations. You will agree, I believe, that it would be hard to find a less progressive industry than meat packing.—*John E. Thompson, President and General Mgr., Reliable Packing Co., Chicago.*

COMMENT—Thanks for the kind compliment and the to-the-point comments on the need for flexible regulations. As every manufacturer knows, nothing ties the hands of progress, efficiency, and economy so much as detailed how-to-do-it specifications.

Only through product-quality, or performance specifications can new and better methods or materials be brought into play to achieve the desired end results.

It would seem within reason, however, for a control agency to disallow a practice or situation that would make it impossible to meet the end-product standards.—The Editor.

SALES SHOW it pays to package in film made of BAKELITE Polyethylene

"ground beef sales have gone UP 33%!"

Piedmont's Best packages supplied by **Package Products Co.**, Charlotte, N. C.

Small wonder I. N. Johnson, manager of Yadkin Valley Packers, Incorporated, Elkin, N. C., is solidly sold on packaging in film made of BAKELITE Brand Polyethylene. But, sales increases (as much as 300% with chickens) are only one part of the story.

"Bags for ground beef cost less than 25% of what we used to pay for tubs. And besides being cheaper to buy, they're cheaper to fill." Furthermore, for turkeys in the freezer, polyethylene "doesn't get brittle no matter how cold it gets."

It solves a "handling" problem too. "Packaging liver used to be messy . . . drippage no matter how we wrapped it. Now, we put liver in polyethylene bags, and that's that."

Summary: "Our sales are increasing. So are the number of items we supply, and polyethylene packaging is tied right into our expansion plans."

Surely, here is experience that suggests that *you* talk to your packaging supplier about the visual appeal, brand identification, toughness and product protection of film made of BAKELITE Polyethylene.

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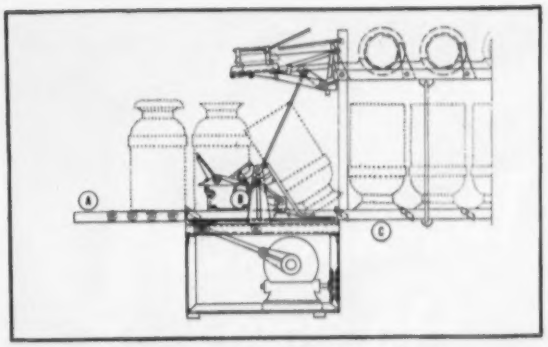
Recent Inventions



Milk-Can Unloader Cuts Handling Costs

Containers advancing intermittently along conveyor (A) are automatically delidded, then inverted for unloading by pivoted lifting and lowering cradles at (B). Empty units, drained along conveyor (C) on way to washer, are subsequently re-covered.—*F. J. Wetzel to W. P. Equipment Corp., Buffalo, N. Y. No. 2,723,792. Nov. 15, 1955.*

PRODUCTS

Thixolabile Oleaginous Spread Consisting of Edible Glyceride Oil, Mono- and Diglycerides as Microcrystals, Polyalkylene Glycol Ester of Fat Acid—E. P. Jones, H. J. Dutton, and J. C. Cowan, Peoria, Ill. to USA. No. 2,718,469. Sept. 20, 1955.

Stable Whole-Milk Powder by Separating Fresh Whole Milk Into Cream and Skim, Adding Starch to Cream, Combining With Skim, Drying, Sealing Grains in Edible, Water-Soluble Coating of Tapioca Starch, Methyl Cellulose, Milk Sugar—J. H. Rollins, Toledo, and H. R. Turner, Bluffton, Ohio. No. 2,719,792. Oct. 4, 1955.

EQUIPMENT

Indented-Fruit Orientor Having Conveyor, Receptacles With Bottom Apertures, Fruit-Rotating Wheel, Actuating Means.—H. E. Metcalf, Los Angeles, to S & W Fine Foods, Inc. No. 2,720,962. Oct. 18.

Drum-Handling Lift Truck Employing Vertically Movable Carriage, Horizontally Extending Beam, Grapple Arms, Interconnecting Means—W. W. Cushman, Webb City, Mo., to USA. No. 2,720,992. Oct. 18, 1955.

Continuous Butter Churn With Horizontal Cylinder, Axial Shafts, Adjustable Radial Arms, Vanes—E. Nanz, Stuttgart, Germany, to Societe Pour l'Equipment des Industries Laitieres et Agricoles, and W. J. Sidler, Paris, France. No. 2,721,062. Oct. 18, 1955.

Cheese Mixer Comprising Tiltably Mounted U-Shaped Bowl, Separable Axial Shaft, Curved-End Paddles — S. Bowman, Glendale, Calif. No. 2,721,063. Oct. 18, 1955.

Carbonator Consisting of Tank With Superimposed Connected Chambers, Lower Gas Inlet Having Stacked Disks, Bottom-Chamber Water Inlet, Top Fluid Outlet—H. O. Reichardt, Detroit. No. 2,721,064. Oct. 18, 1955.

Sharpener for Slicer Blades Employing Slidably-Mounted Shank and Sharpening Member, Springs, Actuating Means—X. B. K. Green, New Paltz, and H. Preble, Jr., Cross River, to General Slicing Machine Co., Walden, N. Y. No. 2,721,430. Oct. 25, 1955.

Popcorn Machine Having Popping Mechanism, Downwardly Inclined Product Chute, Perforated Bowl, Forced-Air Means, Vertical Pipe, Distributing Head—D. C. Caswell, Ringsted, Iowa. No. 2,721,510. Oct. 25, 1955.

Coffee Extractor Having Liquid-Receiving Compartment, Endless Flexible Member, Trough-Like Porous Bag, Coffee and Hot-Water Inlets, Spent-Solids Discharge—E. W. Hickey, Baltimore, Md. No. 2,721,511. Oct. 25, 1955.

Corn Husker Comprising Elongated Housing With Upright

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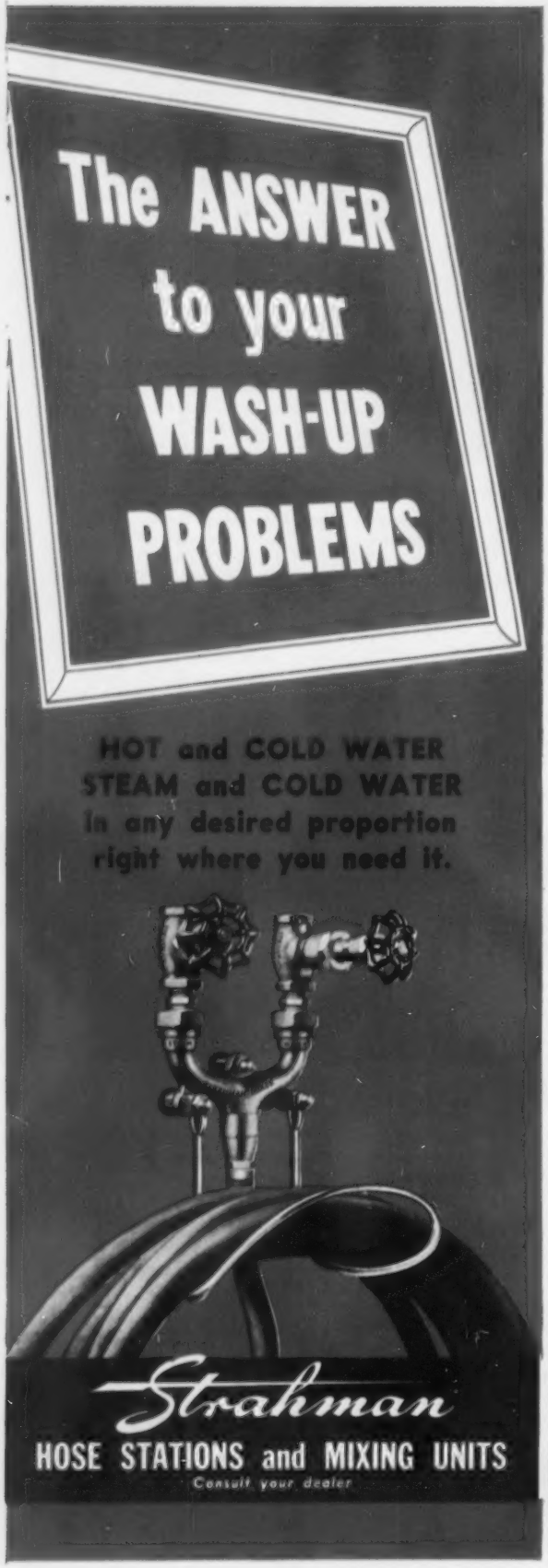
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Side Walls, Rolls, Partition, Husk-Receiving Means, Endless Conveyor—N. F. Andrews, Ankeny, and R. L. Dort, Davenport, to Deere Mfg. Co., Dubuque, Iowa. No. 2,721,557. Oct. 25, 1955.

Knife Assembly for Meat Cutter Consisting of Notched Shaft-Engaging Blades, Radially Recessed Collar, Clamping Member, Guide Plate—H. E. Schaller, Buffalo, N. Y. No. 2,721,593. Oct. 25, 1955.

Food Dicer Employing Horizontal Advancing Surface, Blades, Synchronizing and Product-Disengaging Means—G. E. Warren, Long Beach, and R. J. Purvis, Los Angeles, to Luthi Machinery & Engineering Co., Gardena, Calif. No. 2,721,594. Oct. 25, 1955.

Fish Scaler Having Receptacle-Mounted Frame, Parallel Rotatable Brushes, Drive Means—P. L. Thies, Cheektowaga, N. Y. No. 2,722,037. Nov. 1, 1955.

Precooler Condensate System Comprising Pipe Extending From Vacuum Chamber, Normally Closed Check Valve, Closed Collector Tank—C. R. Anderson, Los Angeles. No. 2,722,112. Nov. 1, 1955.

Want more information on any of these recent patents — if so, you may obtain detailed printed copies by writing direct to the U. S. Patent Office, Washington, D. C., giving serial numbers of those you want and enclosing 25¢ for each copy.

Ice Cream Variegator Consisting of Upper, Lower Extrusion Tubes, Apertured Baffle Plate, Shaft-Mounted Blade—A. C. Routh, Sandusky, Ohio. No. 2,722,177. Nov. 1, 1955.

Apparatus for Removing Lees From Coffee Berries—H. L. Hess, Hato Bay, Puerto Rico. No. 2,722,226. Nov. 1, 1955.

Walnut-Halving Unit Employing Transversely Spaced Endless Chains, Longitudinal Trough, Opposed Initially Retracted Plungers, Nut-Engaging Cups, Circular Saw—R. E. Brooks, Stockton, Calif. No. 2,722,253. Nov. 1, 1955.

Hold-Down Attachment for Meat-Skinning Machine—R. T. Townsend to Townsend Engineering Co., Des Moines, Iowa. No. 2,722,255. Nov. 1, 1955.

Potato-Quartering Machine With Diagonally-Supported Intersecting Blades, Feed Wheels, Actuating Means—J. E. Hise, Gering, Neb. No. 2,722,256. Nov. 1, 1955.

Peanut Pre-Cleaner for Separating Nuts From Trash by Screening—H. C. Gear to Sutton, Steele & Steele, Dallas, Tex. No. 2,722,312. Nov. 1, 1955.

Weight-Responsive Grader Having Endless Conveyor With Article Carriers, Parallel Rail System, Loading Station, Tiltable Scale, Orientation Control—L. M. Butterfield, Kittery, Me. No. 2,722,313. Nov. 1, 1955.

Vegetable Grinder Comprising Shaft-Mounted Abrasive Wheels Within Cylindrical Sieve, Gas-Jet Feed and Recycling Means—A. Rosenbaum, Chicago. No. 2,722,385. Nov. 1, 1955.

Agitating Magnetic Conveyor Employing Longitudinal Track, Parallel Pairs of Magnetically Permeable Rails, Magnet—F. L. Kurek, Maywood, Ill. No. 2,722,406. Nov. 1, 1955.

Flexible Hose Fitting With Rigid Coupling Tube Telescoped Into Convoluted Tube, Tapered Ferrule, Interengaging Flanges, Collar—J. J. Phillips, West Orange, to Titeflex, Inc., Newark, N. J. No. 2,722,437. Nov. 1, 1955.

Radiant-Heat Dryer Consisting of Gas-Tight, Temperature- and Humidity-Controlled Unit Chambers, Heaters, Conveyor, Vents—H. D. Dargert, Huntington Park, Calif. No. 2,722,749. Nov. 8, 1955.

Slicer-Blade Grinding Block Including Channeled Members, Slidable Blocks, Cam—A. J. Metz to Bettendorf Bakery Equipment Co., Bettendorf, Iowa. No. 2,722,782. Nov. 8, 1955.

PROCESSES

Separating Pith From Bagasse Fibers by Dry-Sifting Broken Bagasse, Subjecting to 75-150 Psi. Steam, Compressing, Expanding, Wet-Beating, Removing Freed Pith Cells by Flotation—C. Birdseye to E. G. Birdseye, Gloucester, Mass. No. 2,723,194. Nov. 8, 1955.

Processing Pimentos and Peppers by Peeling, Washing, Breaking, Sorting, Screening, Dicing, Pressing, Concentrating Juice, Dehydrating Meat, Mixing Meat and Juice to Form Dry Products, Packing,

Freezing—E. E. Todd, Malibu, to Ventura Farms Frozen Foods, Inc., Oxnard, Calif. No. 2,723,199. Nov. 8, 1955.

Dehydrating Solid Foods by Cooking Portion of Previously Dehydrated Product with Fresh, Drying—E. J. Rivoche, Washington, D. C. No. 2,723,202. Nov. 8, 1955.

PACKAGING

Labeler With Label Carrier, Presser Comprising Roller and Movable Track, Actuating Means — G. W. von Hofe, Bound Brook, to New Jersey Machine Co., Hoboken. No. 2,720,995. Oct. 18, 1955.

Frozen-Confection Bagger Consisting of Conveyor, Horizontally Reciprocating Member and Magazine, Two-Position Valve—J. L. Canales, Dixon, Calif., to Dixon Engineering Co. No. 2,721,016. Oct. 18, 1955.

Can Filler Having Supply Valve, Stirrup With Magnetic Element Adapted to Retain Can in Position—G. L. N. Meyer, Milwaukee, to Geo. J. Meyer Mfg. Co., Cudahy, Wis. No. 2,721,020. Oct. 18, 1955.

Filling Head Comprising Valve and Liquid-Measuring Chambers, Reciprocable Tube, Container-Centering Bell, Valve—C. L. Day and J. G. Voelker to Crown Cork & Seal Co., Baltimore. No. 2,721,021. Oct. 18, 1955.

Bag Closure From a Flexible Blank Having Adhesive Under Surface, Inner Panels, Hingedly Connected Outer Panels, Shoulder-Like Projections — C. M. Phipps, Neenah, to Marathon Corp., Rothschild, Wis. No. 2,721,023. Oct. 18, 1955.

Machine for Applying Tape to Paperboard Box Blanks—M. G. Shenigo, Sandusky, Ohio, to C. D. Keely, W. Englewood, N. J. No. 2,721,670. Oct. 25, 1955.

Multiply Bag Having Seamless Tubular Wall Formed From Flexible Tube Doubled Upon Itself, Common Transverse Seam Jointing Free Ends of Tube and Opposite Sides of Bag—I. Makrauer to Sydney-Thomas Corp., Cincinnati. No. 2,721,691. Oct. 25, 1955.

Wrapping Machine Employing Conveyor, Folding Fingers, Heat-Sealing Means—M. H. Corley, River Forest, and R. F. Barber, Elmhurst, Ill., to Miller Wrapping & Sealing Machine Co., Chicago. No. 2,722,093. Nov. 1, 1955.

Labeler for Applying Thermoplastic-Coated Labels—S. T. Carter, Shrewsbury, Mass., to Geo. J. Meyer Mfg. Co., Cudahy, Wis. No. 2,722,332. Nov. 1, 1955.

Can Labeler Having Runway, Label Feeder, Container-Advancing Means, Electrically Actuated Stop Member—C. M. Hesson to Chisholm-Ryder Co. of Pennsylvania, Hanover. No. 2,722,333. Nov. 1, 1955.

Bag Filler Comprising Traveling Bag-Holding Head, Engaging and Supporting Members, Cam—R. O. Wilson, Los Angeles, to Woodman Co., Decatur, Ga. No. 2,722,358. Nov. 1, 1955.

Can Holder Consisting of Single Blank With Hingedly Connected Panels That Form Sleeves, Locking Tabs—C. M. Phipps, Neenah, to Marathon Corp., Rothschild, Wis. No. 2,722,365. Nov. 1, 1955.

Wine-Bottle-Seal Cutter Employing Rotatable Split Ring, Inwardly Extending Blade Finger Piece—J. W. Svalgaard, Minneapolis. No. 2,722,736. Nov. 8, 1955.

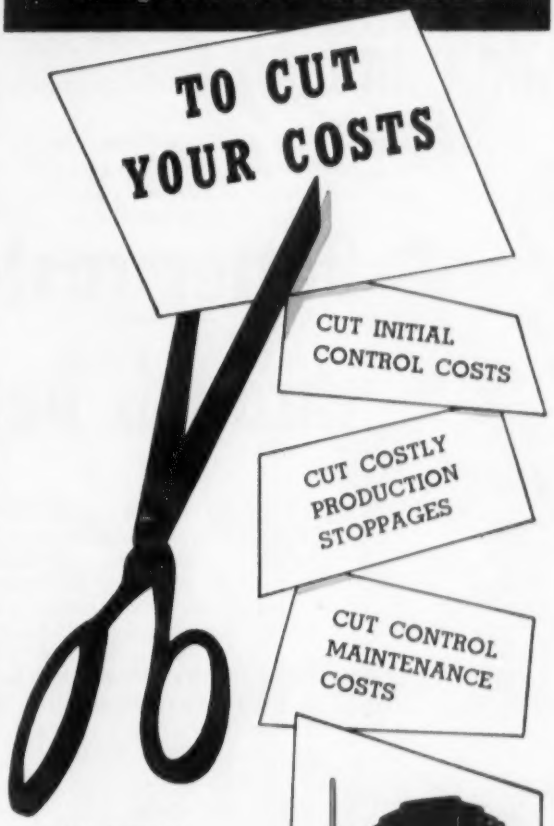
Bottle Closure Having Closed-Top Cup-Like Cap, Stopper, Open-Ended Internally Threaded Band, Inwardly Extending Circumferential Flange —A. L. Merolle to Empire Metal Cap Co., Brooklyn, N. Y. No. 2,723,040. Nov. 8, 1955.

Labeler Comprising Rotatable Multi-Sided Pickup Box, Gum Applicator, Transfer and Labeling Bars—S. E. Banks to Morgan Fairest, Ltd., Sheffield, England. No. 2,723,042. Nov. 8, 1955.

Liquid Filler Consisting of Vertical Supply Conduit, Delivery Valve, Conveyor, Elevatable Platform—W. M. Shanhouse, Roslyn Heights, and E. Daher, Babylon, to S. & D. Development Co., Roslyn Heights, N. Y. No. 2,723,069. Nov. 8, 1955.

Packaging Viscous Products for Pressure Dispensing Without Aeration by Partially Filling Into Valved Container, Evacuating, Pressurizing With Nitrogen, Closing—H. Pyneson, University City, Mo. to Development Research, Inc., St. Louis. No. 2,723,200. Nov. 8, 1955.

Partlow has simplified temperature **control**



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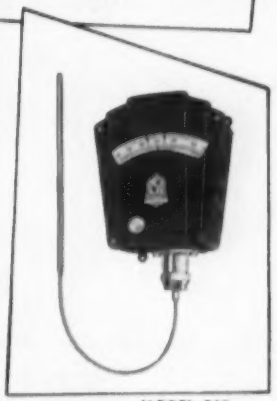

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AUTHENTICATED · CASE HISTORY · From the Current Files of Hoerner Boxes, Inc.

Re: The Tulsa Winch (A Division of Vickers, Inc.)
Tulsa, Oklahoma

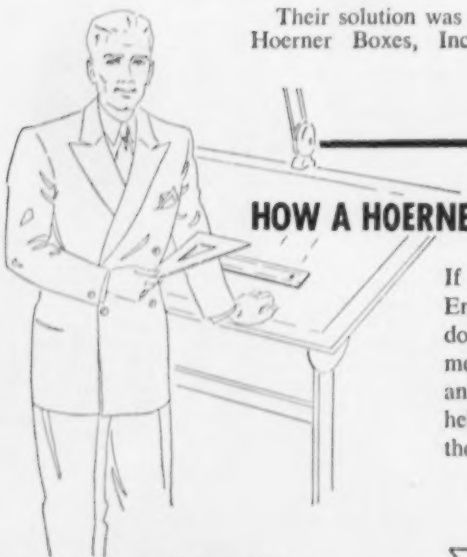
Better customer relations through improved packaging*

Tulsa Winch manufactures power dividers, hanger bearings, power take-offs, transmissions, and winches. They used to ship some of these items in poorly designed boxes and wire-bound crates, but they received too many complaints from customers. The units were difficult to handle and store, they damaged easily, the crates couldn't carry advertising and instructions. Something had to be done.

Their solution was a phone call to Hoerner Boxes, Inc. A Hoerner Packaging Engineer went to Tulsa, made a complete study of the shipping operation, designed corrugated containers and thoroughly tested their strength.

Since his designs have been adopted by Tulsa Winch, customer complaints have stopped, the items can be packaged speedily for rush shipments, they're easy to handle and store, and the container does a selling job for Tulsa Winch.

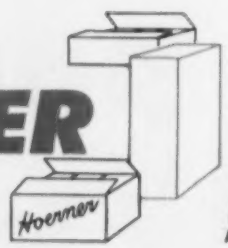
*The Hoerner Packaging Engineer responsible: Marvin C. Catron



HOW A HOERNER PACKAGING ENGINEER CAN HELP YOU!

If your company packages things, have a Hoerner Packaging Engineer make a study of your shipping operation. It doesn't cost you a cent or obligate you in any way. It can mean an increased margin of profit through savings in labor and material plus prevention of shipping losses. It can help you serve your customers better. Just write to one of the Hoerner plants or offices listed below.

Packaging Engineers—Designers and manufacturers of corrugated boxes.



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328 Park Ave., Urbana, Ohio • 2826 Main St., Kansas City, Mo.

HOERNER BOXES, INC.

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PLANTS
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Fort Smith and Little Rock, Arkansas • Sioux Falls, South Dakota
Minneapolis, Minnesota • Fort Worth, Texas • Mexico City, Mexico

Men & Companies

Industry

Carling Brewing Co. plans to construct a new plant in Baltimore, Md.

Chemical Corn Exchange has leased the eighth floor of the former Wanamaker store building in New York City.

Columbia Baking Co.'s president, Ogden Geilfuss, and his associates have acquired controlling interest in the baking firm.

Curtiss Candy Co. has entered its 40th year, celebrated with a dinner honoring its first five employees.

DiGiorgio Fruit Corp., San Francisco, has agreed to acquire an interest in **Tree-Sweet Products Co.**

Dominion Starch Products Ltd., Brockville, **Ont., has** purchased the potato chip, potato starch and flour plants of **F. W. Pirie Co.**, Grand Falls, N. B.

Ferguson-Langfield Frozen Foods, San Francisco, has changed its name to the **Langfield Co.**

General Foods Corp. through its subsidiary, **General Seafoods, Ltd.**, has acquired all rights to Birds Eye trademarks, inventories, and business in Canada.

Glen Maid, Inc., San Francisco dairy, has been organized as a wholly-owned subsidiary of Purity Stores.

John B. Knox has been named president of the Charles B. Knox Gelatine Co., Johnstown, N. Y. succeeding his father **James Knox** who becomes chairman of the board.

Harold W. Comfort (above) has been elected president of the Borden Co., New York City, succeeding **Theodore G. Montague** who has been elevated to chairman of the board of directors.

Halco Products, Inc. has been formed by **H. P. Hood & Sons** and **Babijuice Corp.** to process and distribute fresh orange juice.

Hirsch Bros. & Co., Louisville, Ky., will begin work soon on a new 120,000 sq. ft. plant.

Huron Milling Co. has moved its executive and general sales offices from New York City to Royal Oak, Mich.

International Salt Co. has opened a new laboratory in New York City for research and development concerning salt and related fields.

Kellogg Co. is celebrating its 50th anniversary this year.

Minute Maid Corp.'s Sno-Crop Div. will build a processing plant in the Columbia Basin region of Central Washington.

National Brewing Co., Baltimore has acquired the assets of **Marlin Brewing Co.**, Orlando, Fla., and will operate it as a division of the company.

Northwest Canners Assn. and **Northwest Frozen Food Packers Assn.** have been combined to form **Northwest Canners and Freezers Assn.**

Proctor & Gamble has announced formation of a food products division.

Standard Vanilla Co., Los Angeles, has been purchased

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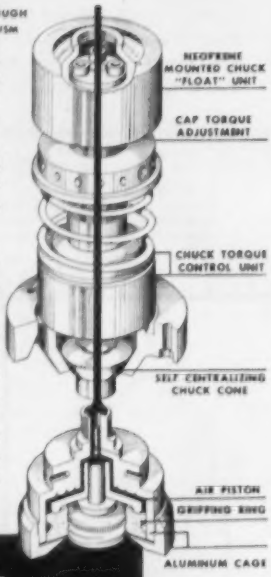
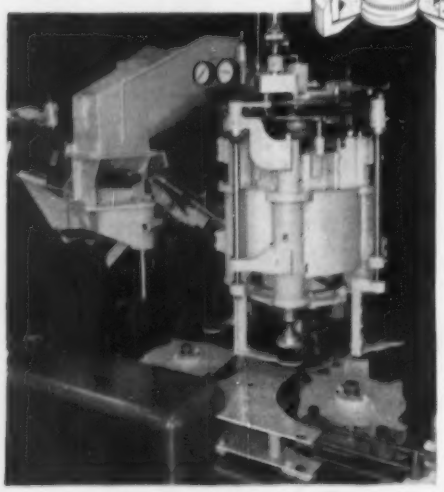
PNEUMACAP



Gently gripped and turned by the air activated neoprene "doughnut" in Pneumacap's new air chuck, the most delicate cap can meet no harm. What's more, cap variations and difficult designs are handled in stride with this remarkably flexible chuck.

Standard equipment on one, four, six or eight-head Pneumacap Cappers, the Sterling Cap Feeder automatically sorts and feeds without churning, marring or breakage. Machine has "no bottle — no cap" safety — a basket is not required to catch excess caps. Feeder action is controlled by Capper operation which "calls" for caps only as needed.



Write for Bulletin No. 128 and get the story in full detail. PNEUMATIC SCALE CORP., LTD., 91 Newport Ave., Quincy 71, Mass. *Also: New York; Chicago; Dallas; San Francisco; Los Angeles; Seattle; Leeds, England. Canadian Division: Delamere & Williams Company, Ltd., Toronto.*

PNEUMATIC

Packaging and Bottling Equipment

A. N. McFarlane (left) has been named vice-president and general sales manager of Corn Products Refining Co., New York City, and **E. F. Schroeder** (right) appointed v.-p. in charge of manufacturing.

by the **Liquid Carbonic Corp.**, Chicago, Ill.

State Packing Co., Los Angeles, has announced further additions to its manufacturing facilities.

Stokely-Van Camp has announced acquisition of **Pomona Products Co.**, Griffin, Ga., and **Fairmont Canning Co.**, Fairmont, Minn.

Van Camp Sea Foods, Inc., and **B. C. Packers, Ltd.**, have purchased $1 million worth of stock of **Coast Oyster Co.**, South Bend, Wash.

Van Kirk Chocolate Co., Toronto has purchased plant and equipment of **Blue Ribbon Corp.**

Van Wagenen & Schickhaus Co. is building a new plant at Kearny, N. J. slated for completion in early 1957.

Wilson & Co. has sold its Chicago meat processing plant and about 24 acres of land to two investment firms.

Wise Potato Chip Co., Berwick, Pa., has announced a $1½ million expansion program due to be completed soon.

Personnel

William J. Carpenter has been appointed vice-president in charge of advertising and sales for Excelsior Quick Frosted Meat Products, Inc., Long Island City, N. Y.

John N. Curlett has been named president of McCormick & Co., Inc., Baltimore spice and flavoring extract house.

J. Charles Derrick has been named v.-p. of Pepsi-Cola Co.

Fred Earnhardt is now a vice-president of Pacific Molasses Co., San Francisco, and will also continue duties as secretary-treasurer.

Edwin Geohegan has been appointed executive v.-p. of Wesson Oil & Snowdrift Co., Inc., New Orleans.

Richard Godfrey is now assistant plant manager of John H. Dulany & Son, Inc.'s Exmore plant.

William Hecht has been elected vice-president of Corn Products Sales Co., New York City.

Dr. Robert P. Joslin, former research chemist for Monsanto Chemical Co., is now product research manager for Fairmont Foods Co.

Allen Jones has been upped to v.-p. in charge of sales and **Jerome Meusel** to v.-p. in charge of research and development for the Baltimore Spice Co.

James Marshall, vice-president, has been elected to the board of California & Hawaiian Sugar Refining Corp.

W. B. Murphy, president of Campbell Soup Co., has been elected to membership of National Industrial Conference Board.

Thomas O'Connor has been named new products group manager of General Foods, White Plains, N. Y.

Dr. Bernard Oser recently celebrated his 30th anniversary with Food Research Laboratories, Inc.

Murry Raphael has been appointed quality control di-

rector of Chunky Chocolate Corp., Brooklyn, N. Y.

E. F. Thomas is now director of personnel for Hunt Foods, Inc., Fullerton, Calif.

Associated Industries

American Can Co. will build a 81 million container manufacturing plant on a 11¼ acre plot in north Salem, Ore.

V. D. Anderson Co., Cleveland, has been sold to **International Basic Economy Corp.**, N. Y., for about $4½ million.

Arkell & Smiths has appointed Roy Jury vice-president.

Bemis Bro. Bag Co., St. Louis, is expanding to manufacture textile specialty items.

Cello Packaging Co., San Francisco, has elected Tom Swan president and Rene Blanquies general manager and treasurer.

Cenpro Corp., Northfield, Ill., has appointed Michael Giordan general plant manager.

Crown Cork & Seal Co. has consolidated its Specialty Division and Crown & Closure Division.

Crown Zellerbach Corp.'s Packaging Research & Development Lab in San Leandro, Calif. has added Gilbert Pitman, food technologist and packaging engineer, to its staff.

Flexible Package Co., Chicago, has merged with its parent company, **Bemis Bro. Bag Co.**

Growers Container Corp., Salinas, Calif., is constructing a new plant to have a capacity of 35 million containers a year.

Guardite Corp., Chicago, has elected John Baer president and William Gates vice-president.

Hagan Corp. has named Dr. Balwant Rai Suri, specialist in food processing, to its staff.

Hudson Pulp & Paper Corp. has chosen Carteret, N. J., as the site for its first paper cup and container plant.

Kaiser Aluminum & Chemical Corp. has announced it is entering the aluminum food container business with one plant on the West Coast through purchase of **Foil Kraft, Inc.**, Los Angeles, and the other in the Mid-West.

O. C. Rowntree has been elected vice-president of R. T. French Co., Rochester, N. Y.

Milprint, Inc. has named Melvin Heller manager of its new frozen food and poultry packaging division.

Ohio Boxboard Co. has acquired the plant and other assets of **Champion Container Corp.**, Plymouth, Mich.

Package Machinery Co., East Longmeadow, Mass., has named Donald Dalbeck president.

Rap-in-Wax Paper Co. has appointed W. E. Zimmermann executive vice-president.

St. Regis Paper Co. has acquired all capital stock in **Chester Packaging Products Corp.**, Yonkers, N. Y., through an exchange of stock.

Sterwin Chemicals Inc. has named Robert Whiteside president.

Thermoid Co., Trenton, N. J., has elected Joseph Cox vice-president and general manager of Essex Rubber.

Deaths

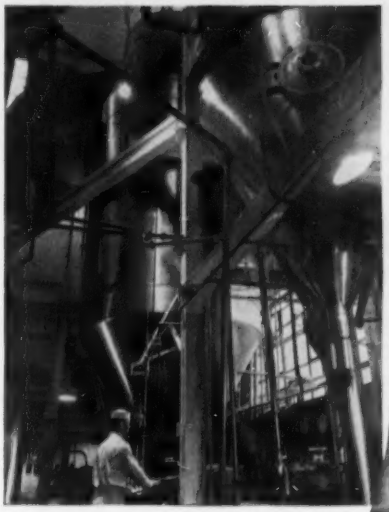
Roe S. Clark, president of Package Machinery Co., East Longmeadow, Mass.—Dec. 22.

Llewellyn Dorsey, 63, professor of dairying, University of Maine.—Dec. 13.

Frank Payne, chairman of board, Crane Packing Co.—Nov. 20.

Andrew Schuler, 72, founder of Schuler Potato Chip Co.—Dec. 25.

NEW PROFITABLE PRODUCT FOR THE DAIRY INDUSTRY!



Foreground: 5400 lb. per hour Mojonnier Lo-Temp Evaporator. Rear: 600 lb. per hour Mojonnier Spray Dryer.

premium grade nonfat dry milk with the Mojonnier LO-TEMP PROCESS

With their Mojonnier Lo-Temp process in steady production, Chattanooga Area Milk Producers Ass'n., Chattanooga, Tenn., Townley Dairy Co., Oklahoma City, Okla., and Westerville Creamery Co., Covington, Ohio, have been commercially producing *premium quality nonfat dry milk*. In a series of comparative tests conducted at the Dairy Technology Dept. of Ohio State University, cottage cheese made from Lo-Temp nonfat dry milk was judged equal in yield, texture, flavor, and moisture retaining properties to cottage cheese made from the best quality fresh pasteurized skim milk.

In proved Lo-Temp NFDM, Mojonnier *Technigeering* has opened new avenues for dairy profit in the production of beverage milk, cottage cheese, buttermilk, chocolate milk, fortifying fresh skim, half and half, coffee cream and other products.

Yield analysis, test data and fully descriptive literature will be sent promptly on request. Write:

MOJONNIER BROS. CO.
4601 W. Ohio St., Chicago 44, Illinois

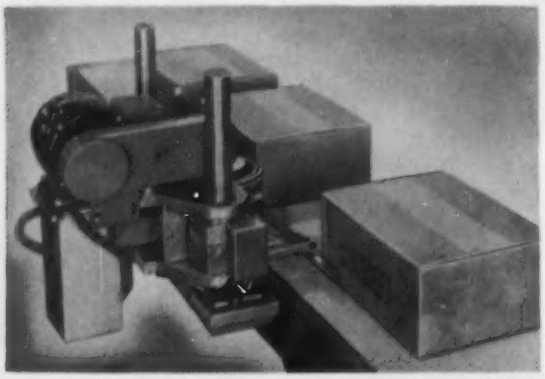
QUALITY Mojonnier YOU CAN TRUST

LO-TEMP PROCESS
Another achievement in Mojonnier Technigeering

For more data, circle this page number on card at back →

New PACKAGING-LINE IMPRINTING ATTACHMENT

makes accurately-located, high-quality imprints on cartons, cases, crates, cans



Model "750" ROLAPRINTER machine . . . imprints contents identifications, other legends on *side* surface of set-up cartons and cases, rectangular metal cans, wood crates, wire or strapbound bundles, etc. Attaches to conveyor, case-sealer, other production equipment. Also available for imprinting all 4 sides.

Model "700" ROLAPRINTER machine . . . imprints code-dates, lot numbers, product names, trade-marks, varieties, etc., on *top* surface of cartons, cases, round or rectangular cans and canisters. Attaches to conveyor or packaging machine.

- **Fully automatic . . . imprints over 100 units per minute**
- **Not just another "marker" but a precision imprinter that gives "printing-press" results**

Here's an attachment that combines the compactness and easy-installation features of ordinary marking devices with the printing-press precision of large in-line imprinting machines. The new Gottscho "ROLAPRINTER" machine is designed for easy do-it-yourself installation in idle space at any practical point on your line. Functions without operator attention by means of microswitch-activated electro-mechanism that controls placement of imprints in exact desired location on containers . . . regardless of whether container flow is regular or irregular. Has built-in motor-driven flexographic printing system with variable speed mechanism that synchronizes its action with surface speed of moving containers to assure clean, sharp, smudge-free impressions. Uses fast-drying liquid ink of any color and rubber type or dies. Quickly, easily adjustable to accommodate different size containers and to vary location of imprint.

Write for descriptive illustrated bulletin, specifying model in which you are interested

Gottscho

ADOLPH GOTTSCHO, INC.

Dept. G, Hillside 5, N. J.

Automatic Production-Line **CODING, MARKING, IMPRINTING MACHINES**

In Canada: RICHARDSON AGENCIES, LTD., Toronto & Montreal

Arbitrating Grievances

—*Continued from page 90*

I do not agree with the procedure of "giving a man a second bite. I do not consider it within my authority. If, as the result of evidence, I find that the employee actually committed the offense, I can only conclude that punishment was warranted.

Either there was a published rule covering the offense, or the employee should have known better. Whatever penalty the company may have imposed, the question arises—was it appropriate to the offense? Though I may disagree with the company's taking discipline, I never substitute my judgment for that of management.

There is one exception. At times the arbitrator is required by the contract to determine the penalty as a part of "just cause." Then I have no choice but to determine whether or not the "punishment" fits the crime.

Penalty Carefully Weighed

Q—Arbitrators often find an employee guilty as charged, but nevertheless order a lessening of the penalty. Do you think arbitrators should thus substitute their own judgment for management's. Some managements asks: What can be done to prevent arbitrators from going beyond the question of guilt?

A (by Mr. B.)—An arbitrator *shouldn't* be prevented from going beyond that question. Many decades ago it was established in the courts that frequently there is a *degree of guilt* and that therefore the *degree of punishment* should be administered in proportion. One who has a long record of good conduct should be sentenced less severely for the given offense than one who has long had a record of bad conduct. This applies in the courts and similarly in labor-management relations.

The object of arbitration is not only to settle disputes, but also to arrive at a conclusion that convinces both parties that they have had a just deal. This is not always possible unless the arbitrator has some latitude.

How Do Losers Take It?

Q—At the end of every arbitration case, one party wins, the other loses. What is the usual reaction of the loser?

A (by Mr. B.)—Win, lose, or draw, both sides usually carry out the award. It is a great tribute to both managements and unions, it seems to me, that the tremendous majority of awards are carried out without any fussing.

However, this commentary seems appropriate: The parties to an arbitration reserve the right to cuss out the umpire on a close decision—just as you and I do at a ball game.

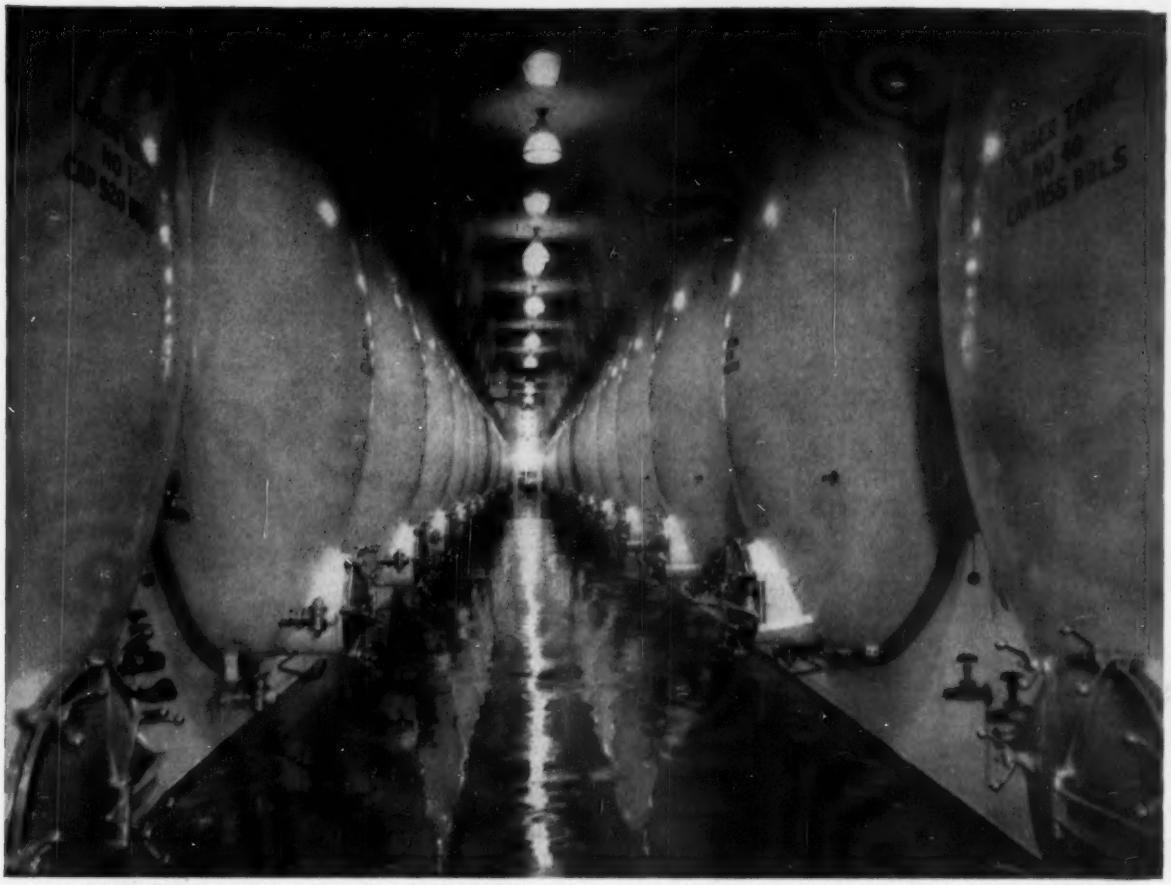
Fortunately, it is the inalienable right of Americans to cuss out the laws, the police, the President, or the courts, or anybody else.

However, more than 98% of the awards are accepted with nothing more than a gripe by the loser.

Q—When a management consistently loses in arbitration, those in authority must face up to the fact that they frequently haven't had real cases. What should such management do?

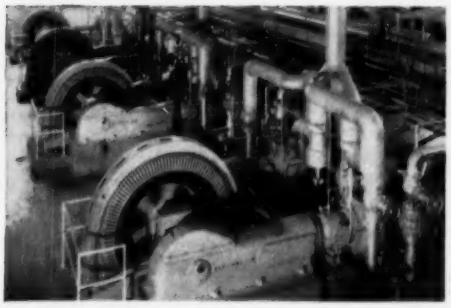
A (by Mr. J.)—Re-evaluate their supervisory training program, its policies and practices, and also study all clauses of their contracts.

End (*Resume reading on page 92*)



IN LAGERING CELLARS, beer is aged under controlled, near-freezing temperatures maintained by Worthington equipment.

Worthington keeps beer cold, employees cool at new Budweiser plant



RELIABLE REFRIGERATION for the "King of Beers" is provided by these four Worthington compressors, which supply a total of 1660 tons of refrigeration.

ABOUT THE BEER . . . critical stage in beer-making is the ageing or lagering of the brew.

At the new Anheuser-Busch plant in Los Angeles, Worthington refrigeration equipment is keeping a rigid check on the temperature inside the lagering tanks. It's here under constant, cold temperature that the distinctive flavor of Budweiser comes of age.

ABOUT THE EMPLOYEES . . . Worthington compressors also provide comfortably cool air conditioning for the brewery's offices, dining room, bottling shop and administration building. Budweiser management figured that a comfortable shop is a happy, efficient shop . . . and high annual production with little personnel turnover proves they were right.

SOLVING TOUGH REFRIGERATION PROBLEMS is a daily matter at Worthington. We'd like to focus on yours. Write us today. Worthington Corporation, Air Conditioning and Refrigeration Division, Section A.5.62-FE, Harrison, N.J.

A-562

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Whichever fat you use for **mono**, molecular distillation makes it work better

Distilled monoglycerides are now in production made from:

cottonseed oil
soybean oil
lard
edible tallow
vegetable oleic acid
hydrogenated lard
hydrogenated soybean oil

Distilled monoglycerides made from the following have been produced on a semi-commercial scale:

peanut oil
hydrogenated cottonseed oil
vegetable palmitic acid

The way we purify them by our unique molecular distillation process gives all these monoglycerides something in common: an unusually high monoester content, and an almost complete freedom from fatty acids, catalysts, and other impurities that degrade taste and odor and inhibit emulsifying properties. Which oil makes the best monoglycerides for your purpose depends on what you want it for. The best way to find out is by making comparative tests on the formulation problems that confront you with a complete set of samples. You get samples of distilled monoglycerides made from the oils listed above by writing to ***Distillation Products Industries,*** Rochester 3, N. Y. Sales offices: New York, Chicago, and Memphis • W. M. Gillies and Company, Los Angeles, Portland, and San Francisco • Charles Albert Smith Limited, Montreal and Toronto.

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New Catalogs and Bulletins
from manufacturers of equipment and supplies
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PLANT ENGINEERING

Wide Motor Line

Leaflet gives prices for extensive line of ¼ to 20 hp. motors. Details and pictures some of company's special power units. Covers polyphase and single phase induction motors. 2p.—*Reuland Electric Co., Alhambra, Calif. (210A)*

Solder-End Valves

Concerns a new line of 5, solder-end gate, globe, and check valves. Charts list dimensions and pressure ratings. Bulletin 603, 2p.—*Lunkenheimer Valve Co., Cincinnati, Ohio. (210B)*

Refrigeration Equipment

Tabbed notebook depicts a line of chillers, coolers, receivers, condensers, and heat interchangers. Each unit is pictured, and comprehensive tables give full data.—*Heat-X-Changer Co., Inc., Brewster, N. Y. (210C)*

Plastic Stock Material

Bulletin shows properties and advantages of nylon and Teflon bar, sheet, and rod stock. High pressure tubing also listed. Bulletin K-51, 4p.—*Polymer Corporation of Pennsylvania, Reading. (210D)*

Transducer Engineering

Illustrated booklet considers fundamentals of magnetostrictive transducers. Tells function, type, and performance of these electronic units, which are used to convert electrical input energy to mechanical output energy. 38p.—*International Nickel Co., Inc., New York City. (210E)*

Stainless Steel Prices

Two bulletins show new adjusted base prices on cold-finished stainless steel wire and hot-rolled wire rods. 60p.—*Crucible Steel Co. of America, Pittsburgh. (210F)*

Steam Trap Selection

Company magazine contains article on proper selection and use of various types of steam traps. Reprints available. Yarway News, December, 1955.—*Yarnall-Waring Co., Philadelphia. (210G)*

Diaphragm Valves

Concerns rugged, straight-through-flow diaphragm valve, said to give leakproof control of acids, oils, alkalies, slurries, and other hard to handle fluids. Device is available in wide range of metallic and non-metallic body materials in sizes from ½ to 14 in. for threaded or flanged connections. Bulletin 101, 4p.—*Stockdale Engineering Co., Haddonfield, N. J. (210H)*

Horizontal Evaporators

Facts given for a series of straight-tube and U-tube horizontal shell-type evaporators for boiler make-up water. Cross section drawings show construction details. Bulletin supplement 10-DE, 2p.—*Schutte & Koerting Co., Cornwells Heights, Pa. (210I)*

Solenoid Valves

Illustrates new line of stainless steel solenoid valves, designed to eliminate hammer-shocks in automatic control systems. Models available in normally-open and normally-closed types, in three sizes; 1¼, 1½, and 2 in. Bulletin K, 4p.—*J. D. Gould Co., Indianapolis. (210J)*

Sump Pumps

Concerns a series of single, duplex, and other vertical sump pumps. Selection chart lists capacities in GPM and gives other pertinent data. Bulletin 4500, 8p.—*Deming Co., Salem, Ohio. (210K)*

Brewery Relief Valve

Pictures and describes operation of a relief valve designed to vent excess pressures in brewery tanks. Bulletin 925, 1p.—*Pfaudler Co., Rochester, N. Y. (210L)*

Refrigeration Controls

Comprehensive catalog lists wide line of humidity controls, thermostats, relays, valves, and other devices for control of refrigeration and air conditioning systems. All units are pictured, and much engineering data is provided. 58p.—*General Controls, Glendale, Calif. (210M)*

Slide Valves

Describes application, design, and operation of a line of slide-gate-type segregating valves for pneumatic materials handling systems. Shows models available for automatic or remote operation, as well as manual types. Units are used mainly to sectionalize piping system, confine operating vacuum to one section, and to facilitate discharge of cyclone collectors. Data Sheet Ua, 4p.—*Allen-Sherman-Hoff Co., Wynnewood, Pa. (210N)*

Non-Metallic Pump Parts

Report concerns findings on use of non-metallics for interchangeable impellers in small displace-

ment pumps. Gives inside story on their operation and advantages. 4p.—*Eco Engineering Co., Newark, N. J. (210O)*

Gear-Motor Line

Specification sheet lists main facts for a line of compact, ¼ to ¾ hp. gear-motors. 4p.—*Little Giant Products, Inc., Peoria, Ill. (211A)*

Plastic Pipe, Valve Facts

Illustrates and details uses and installation of a line of plastic pipe and fittings. Of particular interest is a new all-plastic valve. Bulletin PE-40, 12p.—*Corning Glass Works, Corning, N. Y. (211B)*

Controlled Volume Pumps

Application of a new pumping unit for additive injection, bottle filling, proportional feed, and fluid sampling systems is detailed. Pump operates under "downhill" conditions, from high suction pressures to low discharge pressures. Bulletin 855, 4p.—*Milton Roy Co., Philadelphia. (211C)*

Process Heating Equipment

Electrically-heated vaporizers and forced circulation liquid heating and cooling units that use a heat transfer oil are presented. Units provide a wide range of accurately controlled temperatures at low pressure. Bulletin DV, 4p. —*Union Iron Works, Erie, Pa. (211D)*

New-Type Pump

Considers features and advantages of a new centrifugal pump that handles liquids containing solids, air, or gases, without vapor binding, venting, clogging, or unnecessary regulating. Unique impeller design discussed. Form 7325, 6p.—*Ingersoll-Rand, New York City. (211E)*

Plastic Tubing Applications

Considers wide food usage of a modified vinyl plastic tubing. Coupling methods and cleaning procedures are detailed. Bulletin T-87, 28.p.—*United States Stoneware Co., Akron, Ohio. (211F)*

Steam-Jet Vacuum Pumps

Covers applications, features, construction, and operation of both condensing and non- condensing two-stage steam jet vacuum pumps. Descriptions include barometric intercondenser, special low-level arrangement for direct-contact condenser, and surface condensers. Bulletin 5H2, 12p.—*Schutte and Koerting Co., Cornwells Heights, Pa. (211G)*

Sectional Storage Areas

Concerns application of semi-circular prefabricated panels in constructing temporary or permanent storage warehouses. Units are said to be easily handled by two men and quickly bolted together to form shelter sections. Rental plan is available.—*Yard-Stor Shelter Co., Detroit. (211H)*

Hydraulic Data

Engineering bulletin considers generation and dissipation of heat in hydraulic circuits. Information considers heat-transfer area, oil circulation rate, pumps, pipes, and valves. Data will assist in engineering installation and operation of hydraulic systems. Bulletin 90030, 8p.—*Oilgear Co., Milwaukee. (211I)*

Dust Filters

Depicts full information on a series of dry, dust separators that utilize felt-lined tubes for high filtering efficiency. Bulletin 559, 22p.—*Day Co., Minneapolis. (211J)*

Motor Mountings

Interesting article shows mounting arrangement for converting shaft-driven machines to individual motor drives. Spring-mounted column maintains constant belt tension and a control lever enables speed changes. *Motorization*, Sept., 1955.—*A.C.E.C. Electric Corp., New York City. (211K)*

Bucket Elevator Components

Details and illustrates unusual design of a bucket elevator chain. Units are illustrated and listed for all available sizes. Data on drive wheels tells pitch, diameter, bore, and weight data. Catalog DC-855, 8p.—*Beaumont Birch Co., Philadelphia. (211L)*

Plate Coils

Literature illustrates and gives prices for a series of plate-type coil panels. Tables show technical data on units, which can be used for either heating or cooling. Bulletin 256, 4p.—*Dean Products, Inc., Brooklyn, N. Y. (211M)*

Air Compressors

Comprehensive catalog gives full facts on a series of single and two-stage air compressors. Units are available in ½ through 20 hp. Provides information on accessories and additional engineering data. Catalog 36, 44p.—*Brunner Mfg. Co., Utica, N. Y. (211N)*

Heat Exchangers

Concerns a series of shell-and-tube heat exchangers for rapid liquid heating. Numerous graphs and charts present selection data. Diagrams illustrate systems. Catalog 552, 32p.—*E. C. Cooley Co., San Francisco. (211O)*

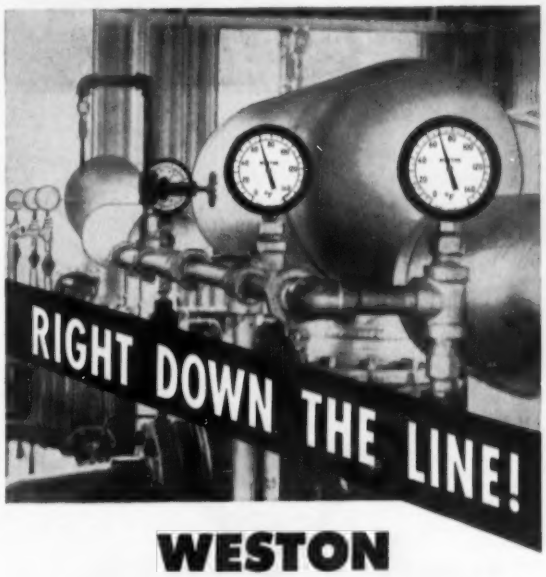
Vibration Inhibitor

Gives facts and installation information on a granular block-material used for machine mountings. Material absorbs vibration to eliminate shock and noise. Catalog IS-55, 4p.—*T. R. Finn & Co., Inc., Hawthorne, N. J. (211P)*

Air Tube Communication

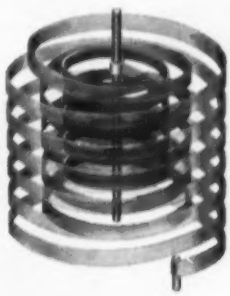
Comprehensive manual details installations of a pneumatic system for conveying messages, papers, and other information.

DEPENDABILITY



WESTON THERMOMETERS

with Multiple bimetal helix



The reasons why WESTON all-metal industrial thermometers excel in dependability and long life... enjoy such outstanding preference throughout industry... stem in large part from Weston's exclusive design and manufacturing methods. The critical *sensing elements* are all Weston-made in the shorter *multiple helix* form to insure rugged, *nonsagging* units. They are then *cycle-seasoned*, over broad temperature ranges, to insure *consistently precise indications* over far longer periods. Thus they serve better, longer, at far lower over-all costs. Bulletin containing sizes, ranges and prices, available on request. WESTON Electrical Instrument Corporation, 614 Frelinghuysen Avenue, Newark 5, N. J.

WESTON *Thermometers*
AVAILABLE THROUGH LEADING DISTRIBUTORS

DEPENDABLE! EFFICIENT! LASTING!

In every industry which employs liquids in processing, you'll find the GGU Pumps serving faithfully. Discharge may be in any of eight positions. Small amount of special metals required for handling corrosives.

STAINLESS STEEL PUMPS

We carry representative sizes of GGU and APCO Pumps in stock in type 316 Stainless Steel for prompt shipment.

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Our entire personnel and facilities are devoted to pump design and manufacture. PUMPS "by Aurora" recognize no superior.

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MANUFACTURERS OF SHARP FREEZE, COOLING, VENTILATING AND HEATING SYSTEMS

System is designed to speed plant communications. 50p. — *Lamson Corp., Syracuse. (211Q)*

Corrosion Resistant Pipe

Two bulletins present reference information for selection of unplasticized, corrosion-resisting piping. Material is available with both threaded and socket-solvent cement fittings. Other helpful data is provided. 8p.—*Alpha Plastics, Inc., West Orange, N. J. (212A)*

Structural Tubing Guide

Presents information on types and lists technical literature available for selection of a wide line of structural tubing. Bulletin TB-360. 4p.—*Babcock and Wilcox Co., Beaver Falls, Pa. (212B)*

Solenoid Valves

Two bulletins present information on a midget, packless solenoid valve, and a corrosion-resistant unit. Charts give pressure ratings and cut-away drawings show construction. Price list also included. Bulletin 8314 and 8210A, 4p.—*Automatic Switch Co., Orange, N. J. (212C)*

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Any of these very-latest catalogs, bulletins, or folders will be sped to you gratis. Just note here the specific literature you want, then circle each key number (there's one given at the bottom of each item) on the handy Reader Service postcard — back of book. Then sign at the bottom and mail.

For your convenience, too, all items in this department are listed and keyed in the Reader Service Section.

MAINTENANCE

Paint Products

Extensive catalog presents line of heavy-duty industrial maintenance paints and other products. It lists specialized coatings for resisting alkalies, acids, oils, greases, and moisture. Water proofings, roof coatings, caulking compounds and floor patching materials, are also detailed. Catalog 56, 48p.—*Steelcote Mfg. Co., St. Louis. (212D)*

Caster, Wheel Manual

Contains full information on a wide line of casters and wheels for furniture and industrial use. Load limits range from 50 to 800 lb. Various accessories are shown. Catalog 60, 189p.—*Darnell Corp. Ltd., Downey, Calif. (212E)*

Lift Truck Check List

Leaflet lists check points for 50 hr., 250 hr., and 1,000 hr. lift truck service schedules. 1p. — *Elwell-Parker Elec. Co., Cleveland. (212F)*

Welding, Cutting Pointers

Company magazine shows best ways to handle gas, cutting and welding equipment. Comprehensive close-up photographs detail methods. *Linde Tips*, Jan. 1956. —*Linde Air Products Co., New York City. (212G)*

Protective Coatings

Comprises instructions for use of various protective coatings for rust and corrosion control on tanks, towers, pumps, gratings, and other structural units. 4p.—*Amercoat Corp., South Gate, Calif. (212H)*

Pipe Hangers

Bulletin treats of two types of heavy duty vibration hangers, designed to prevent noise and vibration transmission and flexibly support piping systems. Two models have rubber and steel-spring construction. Catalog VH-55, 4p. —*T. R. Finn & Co. Inc., Hawthorne, N. J. (212I)*

Machine Mountings

Heavy-duty line of general purpose, steel vibration mountings is described and specified. Diagrams illustrate construction. Catalog SS-55, 4p.—*T. R. Finn & Co. Inc., Hawthorne, N. J. (212J)*

Welded Pipe Fittings

Presents full information and specifications on a line of alloy, carbon, and stainless steel weld-type pipe fittings. Tolerances, advantages, and other pertinent data is included. Bulletin FB-500, 6p. —*Babcock and Wilcox Co., Tubular Products Div., Milwaukee. (212K)*

Tube Bender

Gives operating instructions and description of a compact, crank-operated tube bender. Machine is designed to produce bends up to 180 deg. and curves are controlled through graduated markings on radius block. Catalog File 1141A12, 4p.—Parker Appliance Co., Cleveland. *(212L)*

MATERIALS HANDLING

Belt Cleat Attachment

Discusses installation of a special cleat device that converts ordinary conveyors to flighted elevators. 4p.—Holz Tire & Rubber Co., Lodi, Calif. *(212M)*

Fork Truck Line

Leaflet gives brief description of a line of electric fork trucks, cranes, and special handling devices. 2p.—*Elwell-Parker Electric Co., Cleveland. (212N)*

Portable Elevators

Depicts two models of a portable, screw-type elevator for handling powders, meals, granular substances and chopped or whole fruits and vegetables. Capacities of 100 and 500 lb. per min. Units are easily dismantled for thorough cleaning. Caster wheels enable units to be moved to different locations. 4p.—*H. A. Reinhardt Co., Inc., Newtown, Ohio. (213A)*

Pan Cooler, Conveyor

Installation of an automatic, bread-pan cooling conveyor is shown in various bakery applications. Faster cooling and compact construction are two advantages listed for this device. 4p.—*Union Steel Products Co., Albion, Mich. (213B)*

Platform Lift Trucks

Informs on a new electric, platform-type lift truck said to speed moving of all types of loads. Power is furnished by a 12-volt storage battery. Pushbuttons, located on handle, control operations. Photographs of component parts illustrate advantages. Bulletin 551-3, 4p.—*Barrett-Cravens Co., Northbrook, Ill. (123C)*

Case Conveyor Chains

Shows action of a chain that flexes in both horizontal and vertical planes and operates around curves with radius as small as 12 in. Applications for moving cases, cartons, and boxes are shown. Bulletin 55-58, 4p.—Chain Belt Co., Milwaukee. *(213D)*

Conveyor Carriers

Bulletin illustrates wide line of standard conveyor carriers, special trippers, and accessories. Bulletin 355, 16p.—Stevens-Adamson Mfg. Co., Aurora, Ill. *(213E)*

Semi-Auto Bag Palletizer

Bulletin details action of a vacuum-operated semi-automatic bag palletizer. Pushbutton operation eliminates hand labor. 4p.—Alvey Conveyor Mfg. Co., St. Louis. *(213F)*

High-capacity Fork Truck

Covers features of a 5,000-lb.-capacity fork truck with 79-in. turning radius. Other advantages and specifications detailed. 2p.—Hyster Co., Portland, Ore. *(213G)*

PROCESSING

Vertical Drier

Relates features of a vertical, continuous-transfer-type turbo drier, particularly efficient in handling fragile or heat-sensitive materials. Also used for sublimation, oxidation, and cooling processes. Available in evaporative capacities from 20- to 30,000-lb. of water per hr. Bulletin 3506, 6p.—*Wyssmont Co., Inc., Long Island City, N .Y. (213H)*

Dough Molder-Panner

Leaflet presents technical data on a machine for molding and panning all kinds of doughs. Unit is designed for use in any semi-automatic or fully-automatic bakery. Capacity up to 100 loaves per min. Publication TP-4-T, 2p.—*Thomson Machine Div., Wallace & Tiernan, Inc., Belleville, N. J. (213I)*

Starch Duster

Shows cost-saving features and sanitation advantages of a pneumatic starch dusting machine. Dough passes through an enclosed chamber where excess dust is withdrawn by suction to a dust collector. Drawings illustrate all details. 11p.—*E. A. Bergholtz Co., Inc., New York City. (213J)*

Versatile Filler

Covers uses and advantages of a single filling unit which will handle liquids, powders, and pastes at speeds up to 240 per min. Powders are ejected by an auger device, liquids are filled by a pump. Machine change-over from one device to the other is said to take less than 5 min. 15p.—*G. Diehl Mateer Co., Strafford, Wayne, Pa. (213K)*

Vibrating Feeder

Concerns facts on a mechanical, vibrating feeder for continuous product feeding to automatic scales, grinding mills, pulverizers, mixers, conveyors, and packaging machinery. Adjustable control governs flow. Operating principles and specifications are detailed. Bulletin 55C, 4p.—*Richardson Scale Co., Clifton, N. J. (213L)*

Centrifugal Separator

Colorful bulletin illustrates continuous separation principles used in this line of centrifuges. Food processing applications are noted, and specifications are detailed. Bulletin 2755, 4p.—*Merco Centrifugal Co., San Francisco. (213M)*

Corn Cutter

Close-up photos show action of a new corn cutting machine. Detection device adjusts machine for different sized ears. Other advantages are detailed. 4p.—*Food Machinery & Chemical Corp., Hoopeston, Ill. (213N)*

Pickle Processing Machines

Catalogue shows line of equipment for drying, filling, grading, and cutting pickle and relish products. 27p.—*Chisholm-Ryder Co., Inc., Niagara Falls. (213O)*

Product Sifters

Covers operation advantages of a series of rotary-type, vertical-flow sifters. Units can be equipped with wood, metal-lined wood, or stainless steel sieves. Machines are said

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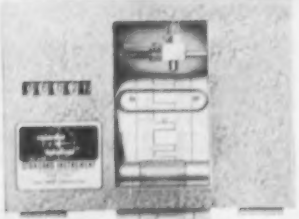

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to be highly sanitary and efficient. Bulletin 135-A, 4p. — *Sprout, Waldron & Co., Inc., Muncy, Pa. (213P)*

Automatic Fermentation

Diagrams and photos illustrate action of a fermentation room that automatically advances dough troughs by a hydraulic mechanism. 4p.—*Union Steel Products Co., Albion, Mich. (214A)*

Size-Reduction Units

Condensed Bulletin quickly lists main features of a series of impact type pulverizers. Units are pictured, and horsepower ratings stated. Catalog 5510, 4p.—*Pulva Corp., Perth Amboy, N. J. (214B)*

INSTRUMENTS

Purge Meters

Covers operation and advantages, application data and design, of a series of purge meters, used for dependable small-flow indication. Many illustrations show different models. Bulletin 120, 8p.—*Brooks Rotameter Co., Lansdale, Pa. (214C)*

Electronic Timers

Comprises pictures and descriptions of a series of electronic timing controls for use in plant and laboratory. Models include delay timer, repeat cycle timers, and interval timers. Technical data for each type of instrument is listed. 6p.—*G. C. Wilson & Co., Huntington, W. Va. (214D)*

Dial Thermometers

Considers features of a series of dial thermometers, available with 3- and 5-in. dial faces. Instruments sense temperature changes through bimetallic probes. Selection data is tabled. Bulletin 98267, 4p.—*Taylor Instrument Companies, Rochester, N. Y. (214E)*

Electronic Controls

Manual features a series of electronic liquid level, timing and switching controls for use in food products. Diagrams and pictures illustrate instruments. 30p.—*Lumenite Electronic Co., Chicago, Illinois. (214F)*

Process Control Panel

Treats of a compact intelligence center that combines process control with process scanning and logging, and permits quick identification, evaluation, and correction of any change in processing conditions. Practical electronic system is said to reduce human error and simplify process supervision. Bulletin 98268, 14p.—*Taylor Instrument Companies, Rochester, N. Y. (214G)*

Stationary Tachometers

Refers to a full line of speed-measuring devices redesigned to give increased life and reduced maintenance care. Units are available for steady readings, indirect calibration, remote reading, wide speed ranges, and can be equipped with scales calibrated to read in any units-per-time. Bulletin 105, 4p.—*Metron Instrument Co., Denver. (214H)*

Pneumatic Integrator

Pictures unique new pneumatic flow integrator that provides continuous accurate totalizing of fluid flow. Compact unit is powered by air and uses no electric motors, wires or contacts. Bulletin 13-23, 8p.—*Foxboro Co., Foxboro, Mass. (214I)*

PACKAGING

Fiber Cans

Shows line of fiber-bodied metal-ended cans. Also depicts a variety of dispensing lids. Various coatings and liners detailed. —*R-C Can Co., St. Louis. (214J)*

Irregular-Product Wrap

Pictures show method of plastic packaging irregularly-shaped meat and dairy products. Twist-type closure and a shrinking process gives tight wrap and protects the foods. Needed equipment is shown. 6p.—*Ansco Packaging Machinery Leasing Corp., Long Island City, N. Y. (214K)*

Heat Sealers

Condensed bulletin covers facts of a series of high-speed, positive-closure heat sealers and conveyors for closing plastic bags. 2p.—*Dough Boy Industries, Inc., New Richmond, Wis. (214L)*

Wrapping Machine Line

Gives quick run down on a wide line of wrapping machines that handle bakery products, candies, meats, dairy products, and other food products. Units operate automatically at high speeds, and use wrapping materials of all types. 18p.—*Hudson-Sharp Machine Co., Green Bay. (214M)*

QUALITY CONTROL

Accurate Manostat

Concerns operation of a compact instrument for regulating and holding a constant vacuum within .05 mm mercury pressure. Bulletin discusses applications and construction, details principles of operation. Bulletin 699, 2p.—*Precision Scientific Co., Chicago. (214N)*

Conversion Tables

Bulletin gives thermocouple temperature to millivolt equivalents. Temperatures are expressed

on International Scale of 1948, electromotive force is given in absolute units. Bulletin F-7255, 16p. — *Barber-Coleman Co., Wheelco Instruments Div., Rockford, Ill. (214O)*

Low-Acid Processing

New edition of *Processes for Low-Acid Canned Foods in Metal Containers* gives full data for specific product processing problems. Bulletin 26-L, 60p.—*National Canners Association, Washington, D. C. (215A)*

Simple Separator

Data sheet informs on uses and purpose of a simply-designed chromatographic analyzer. Unit utilizes a filter paper pile as the absorbing column. Two advantages are said to be ease of isolating large quantities of material, and wide application. Data Sheet 11193, 2p.—*Precision Scientific Co., Chicago. (215B)*

Soft Drink Canning

Research results consider some of the problems encountered in canning soft drinks. 12p.—*Continental Can Co., Inc., New York City. (215C)*

Vacuum Oven

Considers features of a vacuum oven for rapid-drying of delicate materials. Price and pertinent specifications detailed. Bulletin 377, 2p.—*Precision Scientific Co., Chicago. (215D)*

PRODUCTS

Preserve Production

Comprehensive manual details production of fruit spreads and analyzes output by container sizes. Additional chart pinpoints imports of jellies, jams, marmalades and fruit butters for the year 1954. 19p.—*National Preservers Assn., Washington, D. C. (215E)*

Cookie Formulas

Handy booklet presents 50 tested cookie formulas. Ingredients, amounts, and directions for manufacture, are listed in graphic form. 58p.—*Wilson & Co., Chicago. (215F)*

Bakery Formulas

Folder contains booklets and leaflets describing formulas for a wide line of fruit cakes, pies, cakes, cookies, and other bakery specialties.—*Wilson & Co., Inc., Chicago, Ill. (215G)*

Packing House Wastes

"How to do it" manual details wet rendering of packing house wastes. Booklet describes different grades of fat, their uses, and comparative values. Tells of processing equipment needed. 16p.—*Koch Supplies, Kansas City, Mo. (215H)*

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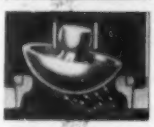

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- No springs required to force the valve to seat
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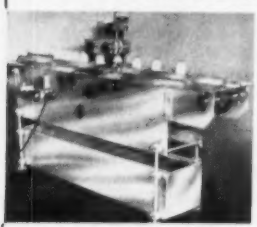

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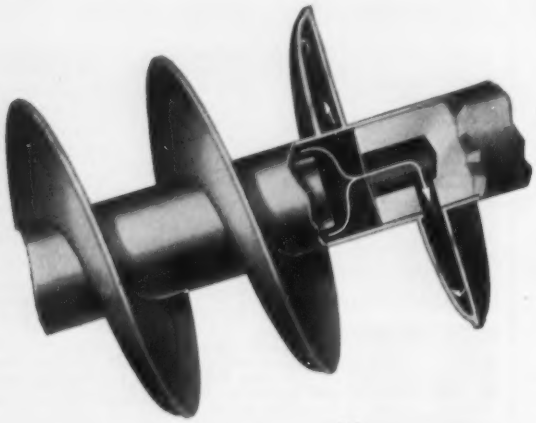

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A simpler, more compact way to cool slurries, solids or pastes—in continuous flow!

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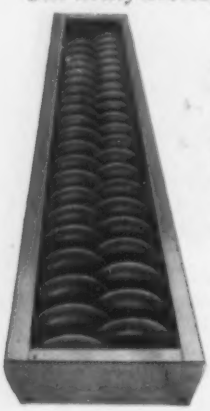

what IT IS!

Basically the HOLO-FLITE consists of two or more flights of hollow-bladed screw conveyors. The product to be processed moves in a trough around the conveyor screws. The heat-transfer fluid circulates through the hollow blades and shafts of the conveyor. The product is constantly rotated into, around, under and over the blades and shafts through which the heat-transfer fluid is circulating, assuring quick, uniform heat passage between the two mediums—*as the product is continuously moved along in a bulk-flow without interruptions!*

Get the complete story on HOLO-FLITE *savings and how this new advancement can simplify your processing operations. It is backed by the same organization that pioneered* COTTRELL *Precipitators and* MULTICLONE *Collectors—your assurance of complete dependability.*

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New 8 page bulletin describing HOLO-FLITE features and applications will gladly be sent on request. Write, wire or phone for your free copy!

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why IT'S BETTER!

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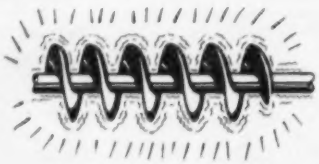
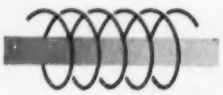


ITS LARGE HEAT-TRANSFER SURFACE requires far less space—as little as 1/5th the space required by other heat-exchange equipment. Further, flights can be "stacked" as high as desired to save floor space, simplify installation!



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1. Bachelor's Degree in Food Chemistry or Technology.
2. Minimum 10 years experience in food field.
3. Adept in all phases product development and quality control.
4. Willing to relocate.

Salary is open for discussion. Replies will be held in strict confidence and should include in reasonable detail educational background, experience, age and present salary.

P-9135, Food Engineering
520 N. Michigan Ave., Chicago 11, Ill.

PLANT ENGINEER

Aggressive young man with engineering degree for New York City division of a National food corporation.

Food plant experience & knowledge of refrigeration required.

Reply in confidence, giving history of education & experience including salaries earned

P-9097, Food Engineering
330 W. 42 St., New York 36, N. Y.

CHEMIST—FOOD TECHNOLOGIST:

Specialty food company serving bakery and ice cream trades has opening for young man with several years experience to manage production and development. Salary commensurate with qualifications and responsibilities. Reply should detail education and experience and include salary requirement.

P-9036, Food Engineering
330 W. 42 St., New York 36, N. Y.

PRODUCTION ASSISTANT

Opportunity for young man with Engineering Degree preferred but not essential for production assistant to Milling Superintendent in large midwest Corn Mill.

P-8237, Food Engineering
520 No. Michigan Ave., Chicago 11, Ill.

SALESMEN

For canning machinery sales and customer contact work. Several openings available. Applicants with mechanical or chemical engineering degree and cannery experience preferred. Please send resume of education, experience, references, salary requirement and recent photo, if available, to:

Canning Machinery Division
Food Machinery and Chemical Corporation
Hoopeston, Illinois
Attention: John R. Hughes, Personnel Mgr.

WE NEED

FOOD TECHNOLOGISTS and FOOD CANNING CANDIDATES
—junior to top-level

Call, write or wire:
Gladys Hunting (Consultant)
Drake Personnel, Inc.
220 S. State St., Chicago 4, Ill.
HArrison 7-8600

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

Position Available. Company with multiple food plant operations requires sanitation supervisor to introduce methods, training materials, etc. in housekeeping and plant sanitation. Will report to production Vice-President and extend staff supervision to sanitarian supervisors at various plants. Must be a real leader. State education and experience. All applications confidential. Reply P-8966, Food Engineering.

Foreign concern in Europe requires first class glass trained and routined operator for a wet process corn grinding plant. Reply P-8838, Food Engineering giving fullest details of previous work and experience, and photo.

SELLING OPPORTUNITIES OFFERED

Wanted . . . Manufacturers Representatives calling on meat packers and other food processing plants to represent Weber Hydraulic Frozen Meat Cutters and Slicers. The finest equipment made for this fast growing field. Commission basis. Old established manufacturer. Write us about your background, lines handled, territory covered. H. G. Weber & Company, Kiel, Wisconsin.

Sales Representatives Wanted for a Production Recorder, the Centralograph, which records in a central location complete production data (including reasons for stoppages) of up to twenty machines; assures increased production; nothing similar; no capital required. D. C. McGlehan, 172 South Broadway, White Plains, N. Y.

POSITIONS WANTED

Production & Research Chemist, with extensive experience in manufacture, development, control of a wide line of confectionery and chocolate products, desserts, cereal products, and other foods, as well as laboratory direction, desires a position of responsibility. PW-9002, Food Engineering.

Plant Manager — Heavy experience salad dressings and specialties. Chem. Engineering background. Strong all phases of production. PW-9190, Food Engineering.

Technical Sales. Sales position wanted in Northern California. Food technologist M.S. degree. 34. Married. Excellent technology experience. PW-9211, Food Engineering.

When Answering
BOX NUMBERS...

to expedite the handling of your correspondence and avoid confusion, please do not address a single reply to more than one individual box number. Be sure to address separate replies for each advertisement.

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E.C.H. SPECIALS

347 SS Tank, 10½'x21'8"x¼", 13,500 gals.
Resina Capper, twin, 120 per min.
S/S Pasteurizer, 200 gal. Jkid. 6 Agtd.
Premier 8" SS Colloid Mill, 30 HP mtr.
Lee 500 gal. 316 SS Still, Complete unit.
Phila. 2 piston S/S Filler, with motor.
Standard-Knapp Wrap-around Labelers.
Capem SIF Capper, Caps up to 88 mm.
Pneumatic Scale Labeler, serial 9894.
New SS Sturtevant #7 Rotary Blender.
MRM S/S 12 Spout Rotary Vac. Filler.

NEW—STEEL & S/S MIXERS, KETTLES, TANKS & DRYERS
Fabricated To Your Specifications
Engineering Advice Available

WE BUY COMPLETE PLANTS OR SINGLE UNITS
WHAT HAVE YOU FOR SALE?
YOU CAN BANK ON
EQUIPMENT CLEARING HOUSE, INC.
111 33rd Street, Brooklyn, N. Y.
SOuth 8-4451—4452—8782

WORLD TANDEM LABELERS
For immediate delivery we will offer World triple tandem labeler, new 1947, priced half of new, complete details, sample bottles and labels upon request; cap. up to 180 bpm; latest type machines made; subject to prior sale.

FS-8993, Food Engineering
330 W. 42 St., New York 36, N. Y.

FOR SALE
NEW MUSTARD PLANT
2—new high speed Mustard Mills
2—new Mustard Pumps
Complete plant for making Mustard.
HOFFMAN BROS.
150 S. Erie St. Toledo, Ohio

AVAILABLE IMMEDIATELY
2 TOLHURST CENTERSLUNG CENTRIFUGES, 48" stainless steel, 2 speed expl. proof motor and controls. New, unused. Reduced price. 1 BADGER VAPOR COMPRESSION DISTILLING UNIT, electric driven, 2000 gal/day or more; good operating condition. Used, price reasonable. 1 TROY 48" CS EXTRACTOR with motor. Used.
ENGINEERING ASSOCIATES
1014 Cecil St. • Salisbury, Maryland • Phone 23427

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

BUSINESS OPPORTUNITIES

Grocery & Market—With property & living quarters. Located thriving community, northern La. Grossing $45,000. Owner retiring. Rendlog Sales Co., 1775 B'way, NYC. PL-7-5345.

Wanted: Well rated food company desiring to add processing of pickle products to present lines. Fresh-pack, salt stock, all varieties to Jar, Sweet, Dill etc. Successful food chemist 20 years consulting experience. BO-8290, Food Engineering.

For Sale: Small plant manufacturing fountain toppings and syrups, flavors, colors. Selling through jobbers. Located in Ohio. BO-9189, Food Engineering.

Food Market— & Property. Including 6-room apt. Located Tompkins County, N. Y. Long established. Receipts $150,000. annually. Fully equipped. Priced right. Rendlog Sales Co. 1775 B'way, NYC. PL-7-5345.

At Your Service . . .
These Classified Sections are at your service to bring business needs or "opportunities" to the attention of men in executive, management, sales and responsible technical, engineering and operating capacities with the industry served by this publication.

SEARCHLIGHT SECTION

(Classified Advertising)

BUSINESS OPPORTUNITIES • EQUIPMENT - USED or RESALE

UNDISPLAYED —RATES— *DISPLAYED*

$1.50 a line, minimum 3 lines. To figure advance payment count 5 average words as a line. BOX NUMBERS count as one line additional in undisplayed ads.
DISCOUNT of 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

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EQUIPMENT WANTED or FOR SALE ADVERTISEMENTS acceptable only in Displayed Style.

Send NEW ADVERTISEMENTS to N. Y. Office, 330 W. 42nd St., N. Y. 36, N. Y. for March issue closing February 23rd

CUT DOWN "SHUT DOWNS" With "Grand Buy" STAND BY FMC FOOD EQUIPMENT

TRADE WHAT YOU DON'T NEED FOR UNITS YOU WANT

Cappers
Centrifugals
Choppers
Clarifiers
Coating Pans
Colloid Mills
Columns
Conveyors
Cookers
Coolers
Cutters
Dicers
Dryers
Evaporators
Expellers
Fillers
Filters
Grinders
Hammer Mills
Heat Exchangers
Homogenizers
Juice Extractors
Kettles
Labelers
Mixers
Ovens
Presses
Pulpers
Pulverizers
Reactors
Retorts
Screens
Sifters
Slicers
Sterilizers
Stills
Tanks
Vacuum Pan
Viscolizers

Complete Plants
Brewery—Distillery
Pectins
Cotton Seed Oil
Fruit Juices—Yeast
Vegetable—Fruit
Canning

FMC FRED. R. FIRSTENBERG, Pres.

FIRST MACHINERY CORP.

209-289 Tenth St., Brooklyn 15, N. Y. Phone: STerling 8-4672

WATER FILTERS
Still erected in food plant in Chicago two used Niagara diatomaceous earth water filters, cap. 300-400 gpm each with 15 Niagara leaves, total area 330 sq. ft. in each filter (can be increased by 1/3), quick-opening cover, 5" manifold, complete pumps and accessories, would cost new today $13,000 or more; our price half of new; inspection invited.

FS-8998, Food Engineering
330 W. 42 St., New York 36, N. Y.

PACKAGING EQUIPMENT
Standard Knapp 6-lane Model 830 automatic case packer with automatic case feed also.
U. S. Bottlers rinser for pints and quarts, reconditioned. 3 Ermold automatic labelers price $250 each, and up. Pneumatic Scale "Samco jr." 10-head straight-line vacuum filler for pints, quarts, half-gallons, cap. 5-40 bpm, all contact points stainless steel. This equipment can be purchased individually or as a complete lot. All is surplus: immediate delivery.
FS-8994, Food Engineering
330 W. 42 St., New York 36, N. Y.

RIGHT PRICE—FAST DELIVERY—GUARANTEED

LOOK

2—Shriver 42"x42" cast iron, plate & frame closed del. Filter Presses, 27-1" chambers.
2—Day 15 gal. Pony Mixers, m.d. S.S. cans.
2—Haskins Cap Tighteners, m.d.
1—4TH Mikro Pulverizer 60 HP, tefc.
2—Stainless Steel Hersey Rotary Dryers, 5'x30' and 6'x23'.
2—8'x125' Rotary Kilns.
3—Buflovac 42x120, 32x120 Atmos dbl. Drum Dryers, complete; 1—American 24x36.
2—54"x70" and 1—40"x60" Bird Continuous Centrifugals, S/S Solid bowls.
3—Unused #12 Sweetland FILTERS, 48 bronze monel covered bottom drainage leaves 3" o/o. latest type; 1—#2, 23 copper leaves 1½" oc.
1—Day #30 Imperial Jack. Mixer, 75 gal.
1—Buflovac 48"x40" Drum Flaker, chrome plated, s/s ends.
9—Sperry 18"x18" Filter Presses, 11 ch.
1—Link-Belt Co. ROTARY DRYER, Rota-Louvre, #502-14 Type C, 5'3" dia. 14' long with #304 S/S contact parts.
5—Horiz. Dry Powder Ribbon Mixers, 4000#, 1500#, 500#.

Our 38th Year

Wanted: Your Idle Machines or Plants

CONSOLIDATED PRODUCTS COMPANY, INC.
158 Observer Hgway
HOBOKEN, NEW JERSEY
Tel.: HO 3-4435 • N. Y. Tel.: BA 7-0600

····IN STOCK AT LOEB'S····

Cappers: Capem, Titecap, Swanson, U. S. automatic and semi-automatic.
Centrifugals: Fletcher 12" copper, 17" stain. steel, 20" lithcoated, Tolhurst 26" copper.
Clarifiers: De Laval model 84-51. Sharples Vaporite, st. steel.
Conveyor, port. Rapid Standard, 16' lg.
Conveyor Tables: belts from 5½" wide x 12' long and up.
Cutter, Bone: Wausau, 5 hp.
Cutters, silent, Buffalo 32" and 43".
Dryer: Devine 2 x 4' vac. drum, st. steel.
Dryers: vacuum shelf, Stokes 20 shelf, Devine 10 shelf. Devine 20 shelf.
Extractor: Troy 26" monel basket.
Fillers, liquid: Peerless 6 valve, Cass gross weight, siphon and vac. types.
Fillers, piston: Stokes, Colton, Elgin, Filler Machine Co. for jars, tubes.
Fillers, powder: Speedee, Triangle, Stokes & Smith, Ferguson, Gump.
Filter Presses: Sperry, Shriver 6"-36", recessed and plate and frames types.
Filters: int. pressure—Alsop, Sparkler, Lomax, Industrial, Sweetland.
Filter, vacuum: Oliver 2½x1', Denver 1x3'.
Fryolators: Pitman gas fired 18" well.
Homogenizer: 2-1200 GPH. Union, 300 GPH. Union, 125 and 400 Gph. Gaulin.
Kettles: Stainless steel 5 to 300 gal., with and without agitators, aluminum 40 to 100 gal.
Labelers: Burt, Knapp, New Jersey, World, Ermold—auto and semi-auto.
Colloid: Premier 3 hp. and 5 hp.
Hammer: Mikro, 2DH, 2TH, Gump #1, Prater, Raymond, Jay Bee, Jeffrey 30 x 24", Williams #2 and BX.
Mixers: Dough type single and double arm, 5 to 100 gal.
Powder: 50 to 2000 lb. capacity.
Portable Electric: ¼ to 5 hp.
Pasteurizer: Wallace-Walker plate type, 200 GPH., st. steel.
Pumps: Centrifugal, rotary, gear, vacuum, all types and sizes.
Retorts: 42 x 72" and 24 x 30".
Screens: Rotex 20 x 48", 42 x 84". Roball 40 x 120" stainless steel. Selectro 4 x 10', Abbe Blutergess #1.
Sealers, carton: Standard-Knapp, Ceco, Triangle, Packomatic.
Sterilizers: Climax 20" x 36" jacketed.
Tablet Presses: single punch and rotary.
Tanks: Glass lined, various sizes. Stain. steel 25 gal. to 1200 gal.
Viscolizer: 150 gal. Cherry-Burrell.

Send us your inquiries and list of idle equipment.

LOEB EQUIPMENT SUPPLY CO.
820 West Superior St. Chicago 22, Ill.
Telephone: Seeley 8-1431 Our 31st Year

FOR SALE

60 gal. Groen S.S. Clad Jkt. Kettle.
100 to 300 gal. S. S. Mix Tanks, water jkt.
225 gal. Vert. S.S. Tanks, Insulated.
250 gal. Vert. S.S. Tank, Insul., agit.
3—475 gal. Vert. S.S. Tanks, 3'6" x 6'6".
42" Buflovak S.S. Vacuum Pan.
60" S.S. Vacuum Pan with accessories.
125 to 1500 gal. Homogenizers or Viscolizers.
3,000 gal. Glass Lined Tanks, Insulated.
3—#10BB Waukesha Pumps, 1 H.P.
#55BB Waukesha Pumps, Variable Speed.
Plate Type Heat Exchanger, 136 S.S. Plates.
50 gal. S.S. Premixer (Tank), side agit.
10 H.P. Cyclotherm Boiler, Oil Fired.
15 H.P. O & S Powermaster Boiler, Oil Fired.
15 H.P. Titusville Boiler, Oil Fired.
Milk Pasteurizers, Coolers, Fillers, Washers.

Send us your inquiries

LESTER KEHOE MACHINERY CORP.
1 East 42nd Street New York 17, N. Y.
Murray Hill 2-4616

FOR SALE

1—150 SQ. FT. STAINLESS HEAT EXCHANGER, SHELL AND TUBE, #4 FIN.
1—2,500 GAL. STAINLESS HORIZONTAL TANK, AGITATED, #4 FIN.
1—2,800 GAL. STAINLESS HORIZONTAL OVAL TANK, #4 FIN.
1—4,000 GAL. STAINLESS HORIZONTAL TANK, INSULATED, AGITATED, #4 FIN.
2—4,700 GAL. STAINLESS VERTICAL TANKS, INSULATED, #4 FIN.
2—14,000 GAL. GLASS LINED TANKS, HORIZONTAL, ALL WELDED.
1—6,000 GAL. ALUMINUM TANK, HORIZ.
1—24"x36" BUFLOVAC DOUBLE DRUM DRYER.

BEST EQUIPMENT COMPANY
617 Davis Street Evanston, Illinois
DAvis 8-0926

A BRILL BUY ... IS THE BEST BUY

SPECIALS

1—I. R. 136 Ton Jet Refrigeration Unit.
1—Buflovak 42"x120" double drum Dryer.
1—Buflovak 6'x5'6" Monel single drum Flaker.
1—Struthers-Wells 5'x15' nickel Rotary Vacuum Dryer.
1—Hersey 18"x12' Hot Air Rotary Dryer 304 S/S.
1—Rietz 30' "Thermoscrew" Screw Conveyor Dryer 304 S/S.
2—Bird 18"x28" Continuous Centrifuges 310 S/S.
1—AT&M 42" Suspended Centrifuge S/S.
6—Sweetland Filters #3, #5, #7, #10, #12.
7—Day, "Cincinnatus" Sigma Blade Mixers 600, 250, 150, 100 and 50 gal.
1—Fitz, Model "D" Comminuter.
1—#4th Mikro Pulverizer.
4—Rotex Sifters 40"x120", 40"x84", 20"x81".

BRILL EQUIPMENT COMPANY
2401 Third Ave., New York 51, N. Y.
OR
4101 San Jacinto, Houston 4, Texas

SPECIAL OFFERINGS

MODERN PACKAGING EQUIPMENT

STANDARD-KNAPP Model 429 Case Sealer and Compression Unit.
PNEUMATIC SCALE COMPANY Cartoning Line, Consisting of: Automatic Feeder, Bottom Sealer, Filler, Top Sealer & Compression Unit.
PNEUMATIC SCALE COMPANY Tightwraps, High Speed.
PNEUMATIC SCALE COMPANY, WORLD and PONY fully automatic and semi-automatic Labelers, 60-120 per minute.
CONSOLIDATED 4 and 3 Head Fully Automatic Cappers.
PNEUMATIC SCALE COMPANY and KARL KIEFER 16 Head Fully Automatic, Stainless Steel Vacuum Fillers.
HAYSSEN Model 8-11 Cellophane Wrapper, latest type.
STOKES & SMITH Model H.G. 84, G, GD and G6 Auger Fillers.
STOKESWRAP Model A with electric eye, counter, stainless steel auger filler.

Partial List—send for complete list of equipment in stock.

WANTED

PNEUMATIC SCALE Large Liners
All Types of Bottling and Cartoning Equipment
PACKAGE MACHINERY CO. Model FA or FAQ Cellophane Wrappers.
Will Buy Single Machines or Entire Plants

ALLIED EQUIPMENT CO.
940-946 Nepperhan Ave., Yonkers 3, N. Y.

STAINLESS TANKS

6—600-gal. each storage tanks, never used.
1— 60-gal. stainless storage tank
1— 30-gal. stainless storage tank
The above eight tanks can be furnished with portable clamp-on type electric agitators if required; can be purchased individually or in lots; immediate delivery; subject to prior sale.

FS-9001, Food Engineering
330 W. 42 St., New York 36, N .Y.

Stainless TANK TRANSPORTS

Lightest Weight—Highest Strength—Best Insulation
All Capacities—Good Delivery for '56
Also Used Units—Sale or Lease
THE BRODIX CORPORATION
217 South Avenue Fanwood, N. J.
Fanwood 2-5555

GLASS-LINED TANKS

4—15,000 gal. each A. O. Smith one-piece glass-lined tanks, 12' dia. x 16'9" long, manholes in heads, fittings and stands, just removed from Eastern brewery; like new; priced 1/3 of new; ideal for storage of food products. Write for details.

FS-9000, Food Engineering
330 W. 42 St., New York 36, N. Y.

FOR SALE

6 Pneumatic Scale Semi-Automatic Jar Cleaners —Double Spout Type, all purchased in 1949 and 1950. All are in good condition.
1 Selectro Screen Single Door, Open Low Deck Construction, purchased in 1947. The machine is in good condition.

FS-9004, Food Engineering
330 W. 42 St., New York 36, N. Y.

NASH HYTOR AIR COMPRESSORS

We have in stock six Nash Hytor air compressors, from 5, 7-½, 10, 15, and 60 HP; capacities up to 225 cfm at 60 psi; real bargain on rebuilt and guaranteed basis.

FS-8996, Food Engineering
330 W. 42 St., New York 36, N. Y.

CARTON GLUER & SEALER

1—Standard Knapp model 429 carton gluer and sealer complete with model 612 compression belt, in excellent condition.

Chemical & Process Machinery Corp.
52 9th St. Brooklyn 15, N. Y.

NIAGARA DIATOMACEOUS EARTH FILTER

Niagara powder filter with 17 stainless and riveted leaves, 250 sq. ft. area with separate closed slurry feeder, reconditioned, first-class condition, all fittings, etc.

FS-8995, FOOD ENGINEERING
330 W. 42 St., New York 36, N. Y.

VORTEX PASTEURIZER COOLING UNIT

Barry-Wehmiller Model 1204 automatic unit, new 1948, still erected and priced about 1/3 of new, inspection invited for this wonderful machine which cannot be readily duplicated. Complete details upon request but subject to prior sale.

FS-8999, Food Engineering
330 W. 42 St., New York 36, N. Y.

TREMENDOUS STOCK MODERN REBUILT MACHINERY

REDUCED FOR QUICK SALE

UNION Rebuilt Machinery — Established 1912

FILLERS & CAPPERS

Filler, Hope, Elgin S.S. Piston Fillers.

Elgin 24-Head Rotary Vacuum Filler.

Resina LC Automatic Capper.

Capem 4-Head Capper.

S. & S. G1, G2, G6 and HG88 Auger Fillers.

Triangle Package Models A3, A1C, G2C, A6CA Elec-Tri-Pak Fillers.

MIXERS

Day, Robinson Dry Powder Mixers and Sifters, from 15 up to 10,000 lbs.

850 gal. Steel Vertical S. J. Mixer, M. D.

Day, New Era, Hottman Mixers 2 to 3500 gals. with and without Jackets, Single and Double Arm Agitators.

Mikro 3TH, 3W, 2TH, 1SH Pulverizers.

Rotex, Day, Robinson Sifters.

WRAPPERS

Very modern Pneumatic Scale Packaging Unit consisting of high speed Carton Feeder and Bottom Sealer, 2—Two Scale Weighers, high speed Top Sealer with Compression Drying Unit, Glue Tight Wrapper, Interconnecting Conveyors.

Stokes & Smith Model 88 Transwraps.

Doughboy, Amsco Rotary Bag Sealers.

Standard-Knapp No. 429 Carton Sealer.

Hayssen, Package Machy. Co. FA, FA4, DF, CA2, Miller, Scandia and Oliver Automatic Cellophane Wrappers.

Hudson Sharp Campbell Auto. Cellophane Wrappers, Models 2W8 and 2W10.

Forgrove Foil Wrapper with underneath fold and adjustable jaws.

LABELERS

Burt and Knapp Wraparound Labelers.

Pony M and ML Labelrites.

MISCELLANEOUS

Brown PFM Auto. Bag Filling Machine.

Fitzpatrick "D" S. S. Comminuter.

Charlotte 3 HP Monel Colloid Mill.

F. J. Stokes Models D, DD2 and RBB Tablet Machines.

Colton 2RP Tablet Machines.

Available For Immediate Delivery At Bargain Prices
Act Now For Choice Selection

UNION STANDARD EQUIPMENT CO.
318-322 Lafayette Street New York 12, N. Y.

TOP PRICES PAID FOR YOUR SURPLUS EQUIPMENT

ANNOUNCEMENT

Our New Location

293 Frelinghuysen Ave.
Newark, New Jersey
TAlbot 4-2050

Expanded facilities will enable us to serve you more fully than heretofore.

Send Us Your Inquiries and Lists of Surplus

THE MACHINERY & EQUIPMENT CORP.
Harry Pearlman, Pres. Bill Wolf, Vice-Pres.

FOR SALE

1—Rogers 48" Stainless Steel Vacuum Pan

1—Buflovak #6.5 Stainless Steel Double Effect Evaporator—588 sq. ft.

1—Conkey Triple Effect Evaporator, Herculoy tubes—1900 sq. ft.—UNUSED

1—Goslin Birmingham Quadruple Effect Evaporator, copper tubes—6685 sq. ft.

2—Davenport 2A Grains Presses

2—Davenport 6' x 40' Rotary Steam Tube Dryers

1—Bowen 5 dia. Stainless Steel Spray Dryer.

1—Overton 24" x 60" Double Drum Dryer —UNUSED

1—Niagara #110-20 Stainless Steel Filter, 110 sq. ft.

4—Ammonia Compressors: York 12½ x 14½; York 11 x 13; Frick 9 x 9; Frick 8 x 8

2—Triangle G-2-C Elec-Tri-Pak Weighers and Fillers

4—225 gal. Vertical St. St. Tanks with Side Agit.

1—10,500 gal. Horizontal Stainless Steel Tank. UNUSED

1—2500 gal. Glascote Horizontal St. St. Milk Storage Tank

1—2000 gal. Vertical Stainless Steel Tank. UNUSED

25—Stainless Steel Tanks—30 gal. to 6500 gal.

2—14,000 gal. Horizontal Glass Lined welded Tanks

25—Stainless Steel and Stainless Clad Steam Jacketed Kettles, 40 gal. to 500 gal.

2—Mojonnier Stainless Steel Vacuum Fillers, model 90

1—Hope type 18 Semi-Auto Single Piston Filler, St. St., Rising table, agitated hopper

2—Patt.-Kelley Twin Shell St. St. Blenders, 5 cu. ft.

BOTTLING CANNING PROCESSING — MACHINERY PERRY SUPPLIES

PERRY EQUIPMENT CORP.

1411 N. 6TH ST.
PHILA. 22, PA.

Phone:
STevenson 4-7210

MEYER "CATARACT" PASTEURIZERS

Take your choice. We have three of these pasteurizer coolers as advertised elsewhere in this publication.

1—Model 935, cap. 100-12 oz. bpm.
1—Model 1656, cap. 132-12 oz. bpm.
1—Model 1345, cap. 225-12 oz. bpm.

Details upon request. Inspection invited.

FS-8997, Food Engineering
330 W. 42 St., New York 36, N. Y.

BAKER AMMONIA COMPRESSOR

Located in Wyoming, one Baker Model 16-12A, 67 ton cap., with "Century" 75 HP induction motor, 60 cycle, 3-phase; separate shell and tube type condenser, receiver, etc., complete installation, attractive prices.

FS-8992, Food Engineering
330 W. 42 St., New York 36, N. Y.

FOR SALE

30" Copper Coating Pans with stem coils
300 gal. Copper Still with condenser and tank
100 qt. 3 speed Read Master Mixer
80 qt. M-80 4-speed Hobart Mixer
100 gal. Copper Steam Jacketed Mixing Kettle
York Freon Compresser with 1½ HP 3 phase motor
Burns Split Nut Peanut Blancher

SAVAGE BROS. CO.
2636 Gladys Ave. Chicago 12, Ill.

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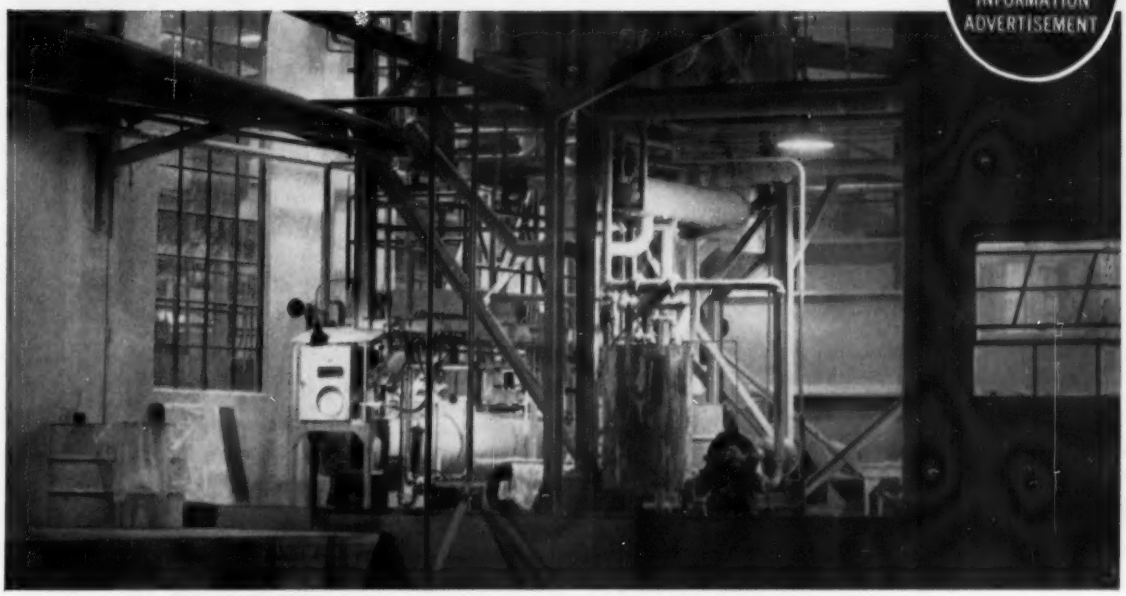
NEW facts for your files on York Ammonia Rotary Booster Compressors for

Frozen Food Warehouses

York refrigeration air conditioning

INFORMATION ADVERTISEMENT



York Ammonia Refrigeration Equipment at the Exchange Lemon Products Company, Corona, California, includes 7 high-speed York V/W Compressors and 3 York Rotary Booster Compressors. This compound compression system totals approximately 100 tons refrigeration at –30°F. suction temperature. Four levels of ammonia pressures are maintained for the various cooling and freezing loads: east storage room at –10°, S.W. storage room at 35°, N.W. storage room at 20°, and freezing tunnel at –40°. Contents of this warehouse would fill a freight train more than 3 miles long.

TEMPERATURES GOING DOWN—and compound compression systems meet lower temperature requirements most economically. York Rotary Booster Compressors are designed for this type of system.

LOAD GOING UP—equipment must deliver more cooling for the space it takes up. York Rotary Booster Compressors provide high capacity in small amount of space.

GREATER LOW-TEMPERATURE ECONOMY WITH COMPOUND COMPRESSION SYSTEMS—and York Rotary Booster Compressors add to economy, always start unloaded to reduce starting power requirements.

OPTIONAL POWER SUPPLY—York Rotary Booster Compressor speeds allow direct connection to, or V-belt drive by, A.C. or D.C. motors and, in some cases, to internal combustion engines.

EASY INSTALLATION—because York Rotary Booster Compressors' compact size and purely rotating motion make much lighter foundations possible. Floor space and headroom, too, are kept to a minimum.

ENGINEERING SERVICE—York's vast experience in the freezing and storage of foods is part of a complete York service available to your design engineer.

Some Helpful Hints for Warehousemen

1. To reduce the amount of air transmission between cold rooms and outside areas, install a double set of doors that create an air lock between the two areas. Also, when possible, have only one door leading into a cold storage area open at a time, since this will lessen drafts.
2. Electric heating coils, installed on jambs, heads and bases of cold storage doors, will prevent them from freezing in place.
3. Install bumper posts several feet out from the hinged end of the cold storage doors. Properly installed, these will "channel" fork lift trucks entering the cold storage areas and prevent them from entering at an angle that could damage the doors. It will also improve the flow of traffic in and out of the cold storage area.

A.I.A. FILE NO. 34-H-4

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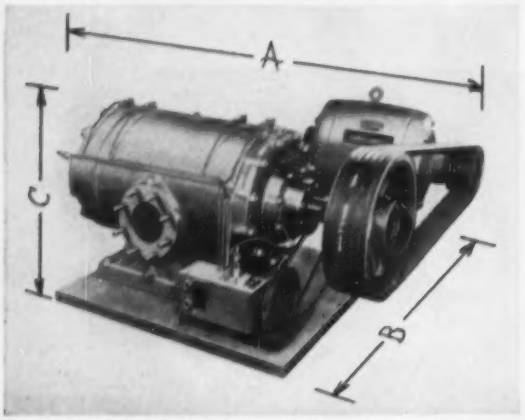
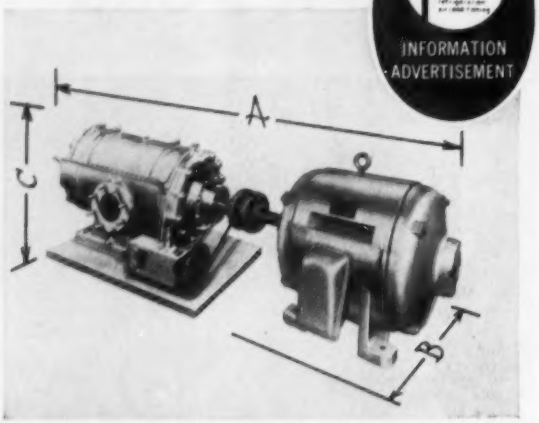
YORK AMMONIA ROTARY BOOSTER COMPRESSORS

INFORMATION ADVERTISEMENT



Model 23C, showing belt drive and base



Model 5CCA, showing direct drive and base

York Rotary Booster Compressors bring important advantages to cold storage warehouses. In compound compression systems, for example, York Rotaries provide efficient and economical operation where evaporator pressures are extremely low. Their volumetric efficiency, under such cases, equals or exceeds that of the reciprocating-type compressor.

TYPICAL DIMENSIONS

V-BELT DRIVE	DIRECT DRIVE
(A) including motor and depending on model chosen 28"-83"	(A) including motor and depending on model chosen 55"-132"
(B) 75"-163"	(B) 29"-111"
(C) 34"-62"	(C) 22"-62"

PRINCIPAL FEATURES

EASY STARTING—Rotary compressor pumping does not begin until centrifugal force causes the blades to move outward to the cylinder wall. Thus, starts are always made from an unloaded position, with only the inertia of the rotor to overcome.

EASY MAINTENANCE—All wearable parts in York Rotary Booster Compressors are easily removed and replaced when worn.

EASY INSTALLATION—Compact size, light weight and vibration-free operation of York Rotary Booster Compressors minimize space requirements and permit easy installation.

OPERATION—York Rotary Booster Compressors consist essentially of a water-jacketed casing or cylinder within which is an eccentrically mounted rotor of smaller diameter. Blades or vanes ride in slots milled into the rotor. The blades are forced to the cylinder wall by centrifugal force. Gas is drawn into the compressor between a pair of these blades; and, as the rotor turns, the blades are forced back into their slots by the cylinder walls, and the gas is compressed.

SPECIFICATIONS—STANDARD UNIT

CAPACITY—from a few tons to 350 tons refrigeration capacity in a single unit.

ROTOR—Special high-tensile strength iron alloy in sizes up to 13. From 13 and above, the rotor and shaft are machined from a single steel forging.

BLADES OR SLIDING VANES—Durable Phenolite, a laminated asbestos impregnated with phenolic resin and heat treated.

SEAL—A spring loaded double seal assembly composed of two cast iron collars and two stationary carbon rings.

LUBRICATION—Mechanical lubricator furnished with each compressor. Individual feed to each lubrication point.

DRIVE—Models 5CCA, 5CCB and 27D may be direct connected only. All other models are available for either direct connection or V-belt drive, dependent upon motor horsepower.

YORK CORPORATION

the quality name in refrigeration

HEADQUARTERS FOR MECHANICAL COOLING SINCE 1885

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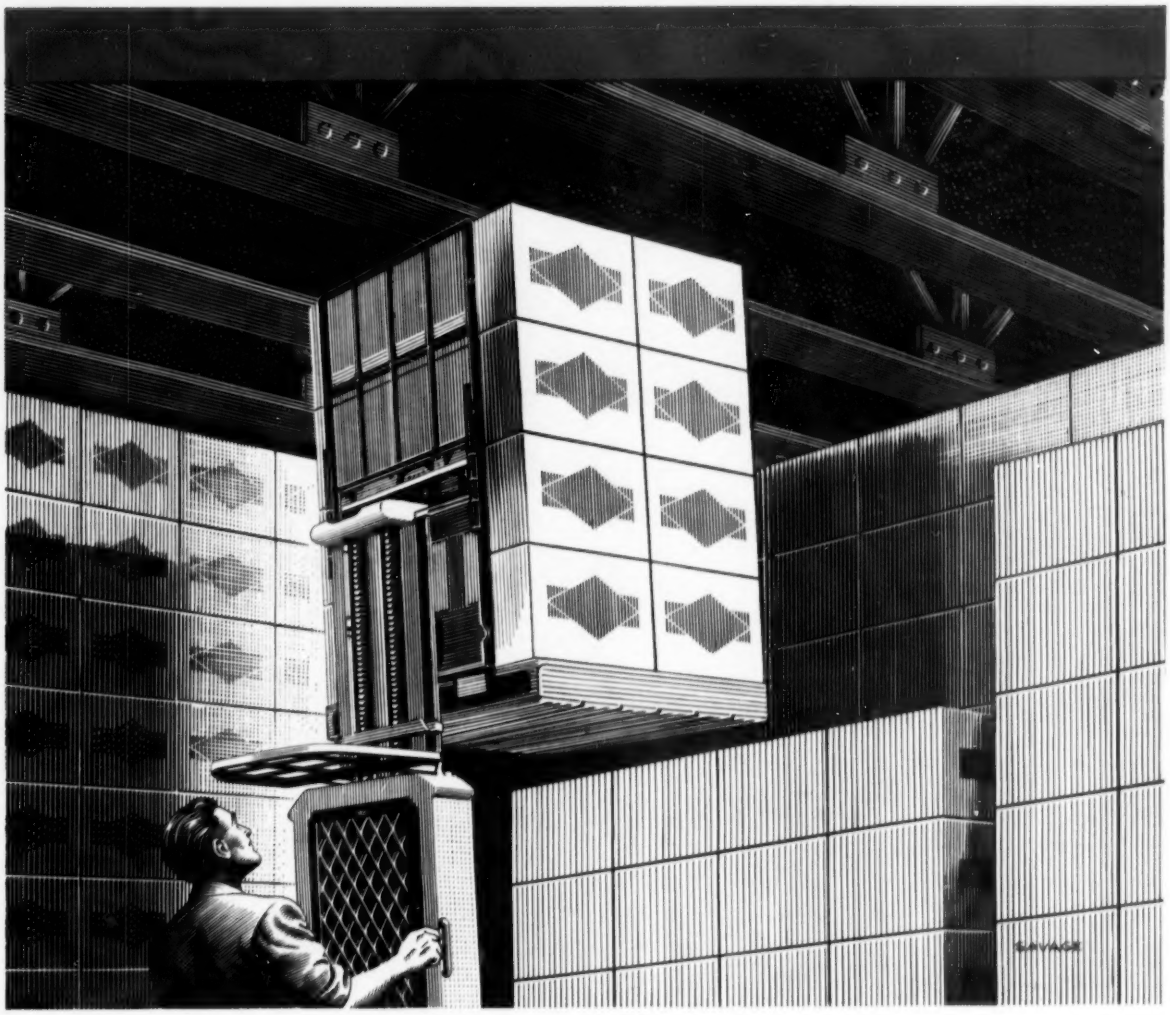

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Open space under your warehouse roof may be clear profit... if you can utilize it by stacking boxes taller. But, before you do, be sure your boxes will stand straight and strong under the increased load. Gaylord containers have this valuable "stack-ability" because they are precision built of the finest quality materials.

For information on containers to help you make full use of all your storage space, call your nearby Gaylord office.

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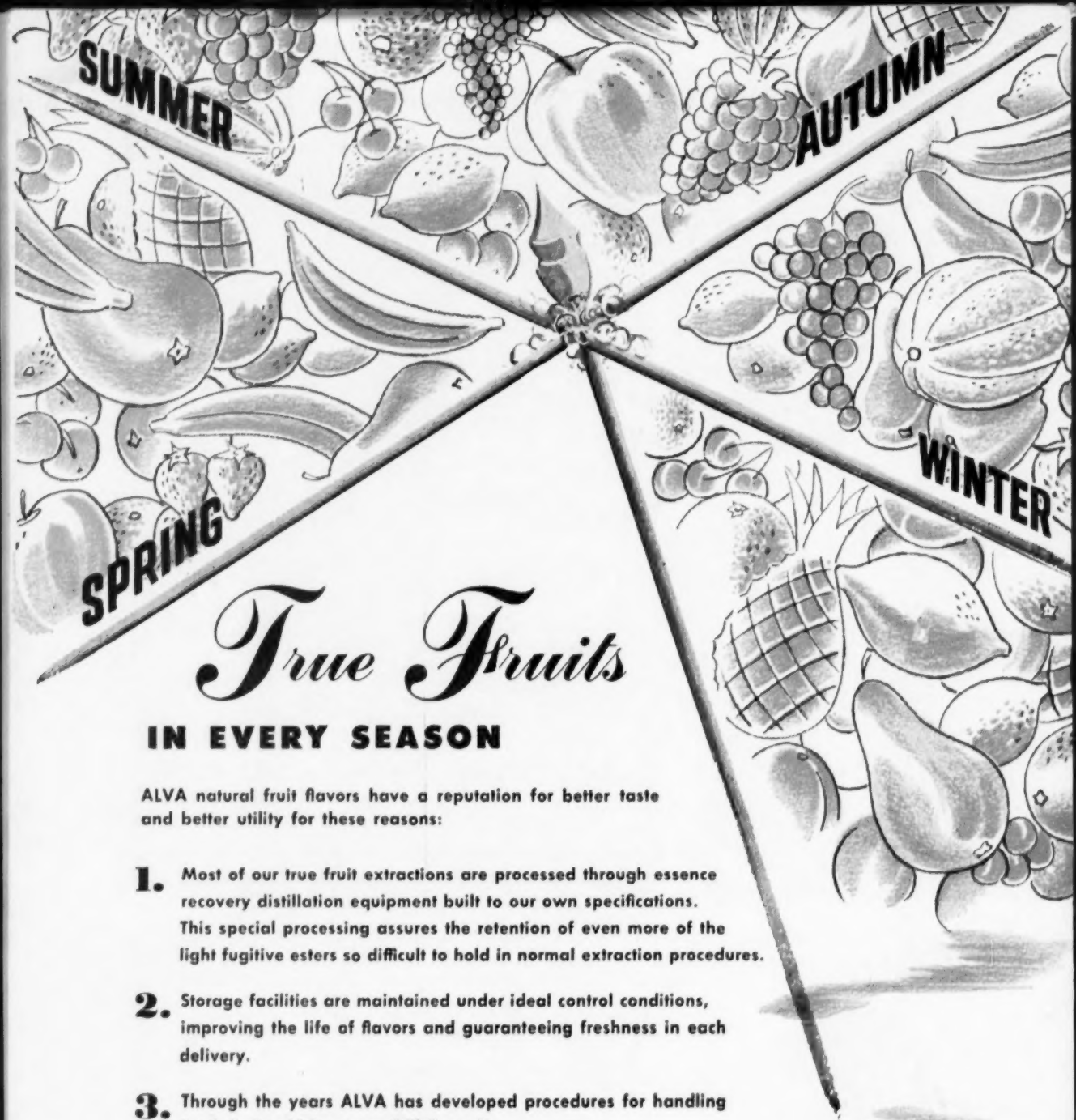

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IN EVERY SEASON

ALVA natural fruit flavors have a reputation for better taste and better utility for these reasons:

1. Most of our true fruit extractions are processed through essence recovery distillation equipment built to our own specifications. This special processing assures the retention of even more of the light fugitive esters so difficult to hold in normal extraction procedures.

2. Storage facilities are maintained under ideal control conditions, improving the life of flavors and guaranteeing freshness in each delivery.

3. Through the years ALVA has developed procedures for handling fresh fruit which assure 100% purity.

ALVA true fruit flavors are ideal for every use, and the ALVA laboratories are eager to help with recommendations and samples for every true fruit problem.

VAN AMERINGEN-HAEBLER, INC.
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